# SDMS US EPA REGION V -1

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# SDMS US EPA REGION V COLOR - RESOLUTION - 3 IMAGERY INSERT FORM

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SITE NAME	SAUGET AREA 1					
DOC ID#	154363					
DOCUMENT VARIATION	X COLOR OR RESOLUTION					
PRP						
PHASE	SAN - SAMPLING AND ANALYSIS					
OPERABLE UNITS						
PHASE (AR DOCUMENTS ONLY)	Remedial Removal Deletion Docket Original Update # Volume of					
COMMENT(S)  COLOR PHOTOGRAPHS FIGURES: 3.25.4.4 - 3.25.4.3; 3.28.4.32; -3.30.4.3.1						

#### FIELD SAMPLING REPORT

Soil, Ground Water, Surface Water, Sediment, and Air Sampling Field Sampling Report Sauget Area 1 – Volume 6 of 9

Remediation Technology Group Solutia Inc. St. Louis, Missouri

September 2000



#### 3.22. Air Sampling

#### 3.22.1. Rationale/Design

Ambient air sampling was conducted to determine the tendency of site constituents to enter the atmosphere and local wind patterns. Air sampling data will be used in the HHRA (construction/utility worker and residential exposure scenarios). The HHRA Work Plan is in Volume 1B of the SSP.

Volatile Organics – Twenty-four-hour cumulative duration sorbent tube samples were collected over a one-day period using TO-1 (Appendix G of the 1999 FSP) sampling protocols in order to evaluate the tendency of site constituents to enter the atmosphere and local wind patterns. Two upwind and two downwind sorbent tube samplers were installed around Site G, and three upwind and six downwind sorbent tube samplers were installed at Sites H, I, and L. Sampling locations were selected in the field with the concurrence of USEPA Region V or its designee.

Number of Volatile Organic Air Samples

13

Analyses:

**VOCs** 

USEPA Method TO-1

Semivolatile Organics, PCBs, and Dioxins - Twenty-four-hour cumulative duration polyurethane foam (PUF) samples were collected over a one-day period using TO-13, TO-4, and TO-9 (Appendix G of the 1999 FSP) sampling protocols in order to evaluate the tendency of site constituents to enter the atmosphere and local wind patterns. Two upwind and two downwind PUF samplers were installed around Site G, and three upwind and six downwind PUF samplers were installed at Sites H, I, and L. Sampling locations were selected in the field with the concurrence of USEPA Region V or its designee.

Number of Semivolatile Organic Air Samples 13

Analyses:

Dioxin USEPA Method TO-9
PCBs USEPA Method TO-4
SVOCs USEPA Method TO-13

Metals – Twenty-four-hour cumulative duration PM 2.5 samples were collected over a one-day period in order to evaluate the tendency of site constituents to enter the atmosphere and local wind patterns. Two upwind and two downwind PM 2.5 samplers were installed around Site G, and three upwind and six downwind PM 2.5 samplers were

installed at Sites H, I, and L. Sampling locations were selected in the field with the concurrence of USEPA Region V or its designee.

Number of Metals Air Samples

13

Analyses:

Metals

USEPA Method 6010B

Degree of Hazard – Organic and inorganic constituents detected will be compiled into a data base. Frequency of detection, average, maximum, minimum, and 95% confidence interval concentrations will be compiled for each detected constituent, along with information on degree of hazard. This information will be used in the HHRA. The HHRA Work Plan is in Volume 1B of the SSP.

Ambient air sample collection is required to measure airborne levels of VOCs, SVOCs, PCBs, dioxin, and metals that may be evolving from the site. An air sample collection and analytical test method was required to measure airborne constituent levels over a 24-hour time period. A 24-hour sample duration was required to average the air emission differences that may occur from the daytime to nighttime cycle from onsite and off-site conditions and activities. Also, air sample collection locations were positioned on the site to collect upwind and downwind samples for differentiation of constituents originating from the surrounding area and those originating from the site. The sample protocol collected site samples over a one-day time period on a very warm, dry day.

The level of detection for SVOCs required by USEPA Region V needs to consider sensitivity and selectivity to analyze complex samples. Based on this need, the analytical method of choice is gas chromatography coupled with mass spectrometry (GC/MS) for detection. Based on the GC/MS analytical method and its sensitivity level, the air sample volume needed to exceed 325 standard cubic feet (scf) to collect a quantity of SVOCs that meet the level of detection required by USEPA Region V.

The sample collection method to meet the above requirements for SVOCs measurement is USEPA Method TO-13 as identified in Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air (June 1988). This method uses a Graseby/General Metal Works, Inc. high-volume air sampling unit for sample collection. Sample collection consists of drawing an ambient air sample at a high-volume flow rate through a PUF collection media over a 24-hour time period. The samples were submitted for analysis of the TO-13 list of SVOCs.

The sample collection method for VOC measurement is USEPA Method TO-1. The sampling method for PCB measurement was USEPA Method TO-4. The sampling method for dioxin measurement was USEPA Method TO-9. The sampling method for metals measurement was PM 2.5.

#### 3.22.2. QA/QC Samples

A field blank (or equipment blank) was submitted to the laboratory with the investigative samples and analyzed for the same parameters as the investigative samples. The minimum required was 1 per 10, or fraction of 10, environmental samples collected. A trip blank for VOC analysis was included with each sample cooler shipped.

A deviation was implemented for types of QA/QC samples taken and is included in Section 3.22.4.1.

#### 3.22.3. Field Procedures

Sample collection consists of placing sorbent tube samplers, PUF samplers, and PM 2.5 samplers at upwind and downwind locations for Sites G, H, I, and L. Sample positioning was located in an unobstructed area at least two meters from any obstacle to air flow. Sample locations were selected in the field with the concurrence of the USEPA Region V or its designee. Since no local power supply was readily available at the sites, gasoline- or diesel-powered electrical generators to supply electricity for the samplers were positioned at downwind locations from the sample collection positions. Wind direction and velocity readings were obtained and recorded in the field log book.

Sample collection protocols followed instruction identified in Methods TO-1, TO-4, TO-9, and TO-13 for sample preparation, calibration, collection, laboratory preparation and shipment, and calculations. Deviation for the type of sampler used is in Section 3.22.4.1. Sample calibrations were recorded in the field log books. During the 24-hour collection period, the samplers were checked every five to six hours to ensure proper operation. At those times, flow readings of the pumping units at the locations were recorded in the field log book. The calibration data, weather data, and flow rate data are summarized in tables in Section 3.22.4.2.

#### 3.22.4. Documentation

Deviations to the QA/QC samples and the field procedure are included in Section 3.22.4.1. Field logs generated are included in Record Book Nos. 3 and 5 (Appendix D). Figure 3 depicts locations of air sampling units. Air sampling report parameters are included in Section 3.22.4.2. Chain-of-custody forms are included in Section 3.22.4.3.

Documentation for this task continues on the next page.

3.22.4.1. Deviation Logs

# **DEVIATION LOG**

NDIVIDUAL REQUESTING DEVIATION: A) CCZK/ DATE 8/26/99	
HEALTH & SAFETY APPROVAL REQUIRED: YES: NO:	
DEVIATION APPROVAL	
PROJECT NAME Solution Survet Area   PROJECT LOCATION Air Samplin	
WEATHER NA PRECIPITATION NA TEMPERATURE	NA
NUMBER OF HOURS WORKED NA NUMBER OF EMPLOYEES NA	
<ol> <li>CONTRACT ITEM BEING WORKED ON:</li> <li>ITEM BEING DEVIATED (REF. APPROP. SEC. OF FSP/HASP):</li> <li>REASON FOR DEVIATION:</li> <li>DEVIATION OR FIELD CHANGE TO BE IMPLEMENTED:</li> <li>EQUIPMENT:</li> <li>DEVELOPMENTS WHICH MIGHT LEAD TO ISSUANCES OF A CHANGE ORDER OR BE THE BASIS OF A CHANGE ORDER OR BE THE BASIS OF A CHANGE.</li> <li>REMARKS:</li> <li>MAIN OFFICE COMMENTS:</li> </ol>	A CLAIM
All major suppliers of DM 2.5 complex & have need contacted consultation of DM 2.5 complex based on the last contacted consultation of DM 2.5 complex for project. However, only 10 of 13 samples were assumed as a labele	
3) Not Enough PM 2.5 samplers available from supplier.	
	M2.55my
5) Sang as 4)	
) Nove & the time	
1) - Simpling will be done @ Same flow rate (16.7 K/mm) no which sampling bere is used OBbic feeling in that from a practice application than the same for a concern. But walknow how EPA is	11.He
- Suppliers are reliable to purchase entirely new PM 2.5 sample control washing to EPA.	lea
- See Almiled Dunision.	
•	
IF ADDITIONAL SPACE IS REQUIRED,	
RECORD ON REVERSE SIDE NATURE OF PREPARER	

285A-1

# **DEVIATION LOG**

INDIVIDUAL REQUESTING DEVIATION:	OB6-	DATE	8/31/99	
Alan J. Cork/Rob Neime.		<b>.</b>	. ,	
HEALTH & SAFETY APPROVAL REQUIRE	D: YES:	_ NO:X		
DEVIATION APPROVAL: Solutia	• • • • • • • • • • • • • • • • • • •	USEPA Region V Rep _		<del></del>
PROJECT NAME Solutia Inc	anget PR	OJECT LOCATION	Snyet Aven	1 Ar
WEATHER NA	PRECIPITATION	NA	TEMPERATURE	Samplin
NUMBER OF HOURS WORKED	VANU	MBER OF EMPLOYEES	NA	
1. CONTRACT ITEM BEING WORKED CO. 2. ITEM BEING DEVIATED (REF. APPRO) 3. REASON FOR DEVIATION: 4. DEVIATION OR FIELD CHANGE TO BE 5. EQUIPMENT: 6. DEVELOPMENTS WHICH MIGHT LEAR (EQUIPMENT: TIME: MANPOWER: ET) 7. REMARKS: 8. MAIN OFFICE COMMENTS: 1) Air Sampling Section  QAPP Culls out field  Lin 70 internal for due: not meable the Aw Surples 3) QAPP information is methods: Information  1. Table 24 in FSP	EIMPLEMENTED. D TO ISSUANCES ( C):  D Aplicates Go Call Give a Cal	Table 24 in FS:  Lin 10 interes  and not consu	P, Table 3 of  I & MS/MS  ex. While f  or Ms/MIO  that I M/TC  able 2A/TC	E QAPP
5) NONE				·
NONE				
7) DAPP formation is St Sedment sample: TO of MS/MIDS	Methods	mater for c do not full	c.   /wwks/grow for field	duste/
>) NON E				<del></del>
	1	0.04		
IF ADDITIONAL SPACE IS REQUIRED RECORD ON REVERSE SIDE	2854-2	SIZNATURE O	F PREPARER	

TLOUIS DIVISION ADVING 1000 DEVLOG WPD

3.22.4.2. Ambient Air Sampling - September 9 Through 11, 1999

Surface weather observations during ambient air sampling from 9/9/99 through 9/10/99.

YEAR=1999

Lat: 38.75

Long: 90.38

Elev: 568 ft

Name: ST.Louis, WSCMO Airport, MO

	Air	DewPt	WetBlb				Wind	Wind
hr = C.S.T.	Temp	Temp	Temp	RH	Press	Altimeter	Speed	Dir
stn mo/dy:hr	(°F)	(°F)	(°F)	(%)	(mb)	(in)	(mph)	(deg)
STL 09/08:00	73	57	63	57	-99	29.83	7	100
STL 09/08:01	73	57	63	57	-99	29.82	5	100
STL 09/08:02	73	59	64	61	-99	29.82	3	100
STL 09/08:03	75	59	65	57	-99	29.82	0	0
STL 09/08:04	73	60	65	63	-99	29.82	3	230
STL 09/08:05	73	60	65	63	-99	29.81	3	250
STL 09/08:06	73	62	66	68	-99	29.84	7	250
STL 09/08:07	73	62	66	68	1010	29.85	12	260
STL 09/08:08	75	62	66	63	1010	29.87	13	260
STL 09/08:09	78	62	67	57	-99	29.88	12	310
STL 09/08:10	78	62	67	57	-99	29.9	16	310
STL 09/08:11	80	64	69	57	-99	29.89	12	310
STL 09/08:12	80	64	69	57	-99	29.92	8	320
STL 09/08:13	80	64	69	57	-99	29.92	9	320
STL 09/08:14	80	64	69	57	-99	29.9	12	330
STL 09/08:15	82	59	67	45	-99	29.89	10	350
STL 09/08:16	82	53	64	36	-99	29.89	8	340
STL 09/08:17	82	53	64	36	-99	29.88	8	350
STL 09/08:18	78	51	62	38	-99	29.88	8	330
STL 09/08:19	75	48	59	38	-99	29.9	7	320
STL 09/08:20	71	48	58	43	-99	29.94	6	330
STL 09/08:21	68	50	58	52	-99	29.96	5	330
STL 09/08:22	66	48	56	52	-99	29.97	3	330
STL 09/08:23	64	50	56	60	-99	29.98	3	290
STL 09/09:00	60	50	54	69	-99	29.99	6	300
STL 09/09:01	60	50	54	69	-99	29.99	5	280
STL 09/09:02	60	50	54	69	-99	29.99	3	290
STL 09/09:03	57	48	52	71	-99	30	7	320
STL 09/09:04	57	50	53	77	-99	30.01	9	300
STL 09/09:05	55	48	51	77	-99	30.01	9	300
STL 09/09:06	55	48	51	77	-99	30.02	6	290
STL 09/09:07	62	48	54	60	-99	30.03	5	280
STL 09/09:08	64	50	56	60	-99	30.03	6	290
STL 09/09:09	71	48	58	43	-99	30.03	6	300
STL 09/09:10	75	46	58	35	-99	30.03	9	300
STL 09/09:11	78	44	59	29	-99	30.01	13	280
STL 09/09:12	78	44	59	29	-99	29.99	10	330
STL 09/09:13	84	62	69	47	-99	29.89	-99	-99
STL 09/09:14	82	42	60	24	-99	29.94	22	320
STL 09/09:15	82	42	60	24	-99	29.92	14	280
STL 09/09:16	82	42	60	24	-99	29.9	13	310
STL 09/09:17	82	. 42	60	24	-99	29.89	17	280
STL 09/09:18	78	42	58	27	-99	29.89	9	300

	Air	DewPt	WetBlb				Wind	Wind
hr = C.S.T.	Temp	Temp	Temp	RH	Press	Altimeter	Speed	Dir
stn mo/dy:hr	(°F)	(°F)	(°F)	(%)	(mb)	(in)	(mph)	(deg)
STL 09/09:19	73	42	56	32	-99	29.9	8	300
STL 09/09:20	71	44	56	37	-99	29.91	6	300
STL 09/09:21	66	46	55	48	-99	29.93	5	330
STL 09/09:22	68	44	55	41	-99	29.95	7	30
STL 09/09:23	66	44	54	44	-99	29.97	7	50
STL 09/10:00	64	44	53	48	-99	29.99	5	50
STL 09/10:00	60	44	51	55	-99	29.99	3	110
STL 09/10:01	57	44	50	61	-99	29.98	0	0
STL 09/10:02 STL 09/10:03	57 57	44	50	61	-99	29.97	5	130
STL 09/10:04	57 57	44	50	61	-99	29.98	0	0
STL 09/10:05	59	44	51	57	-99	29.98	Õ	0
STL 09/10:06	60	44	51	55	-99	29.98	0	0
STL 09/10:07	62	44	52	51	-99	29.98	-99	-99
STL 09/10:07	66	44	54	44	-99	29.99	8	190
STL 09/10:09	71	44	56	37	-99	29.99	-99	-99
STL 09/10:09 STL 09/10:10	73	44	57	35	1015	29.99	-99	-99
STL 09/10:10	78	44	59	29	-99	29.97	-99	-99
STL 09/10:11	80	46	60	29	-99	29.95	-99	-99
STL 09/10:12 STL 09/10:13	84	48	63	28	-99	29.92	9	250
STL 09/10:13	86	48	63	26	-99	29.9	10	240
STL 09/10:15	86	48	63	26	-99	29.87	9	230
STL 09/10:16	86	48	63	26	-99	29.85	6	310
STL 09/10:17	84	46	62	26	-99	29.85	5	270
STL 09/10:17	82	51	63	33	-99	29.85	. 0	0
STL 09/10:19	80	50	62	34	-99	29.86	10	130
STL 09/10:20	80	51	62	36	-99	29.87	9	110
STL 09/10:21	75	53	62	46	-99	29.88	Ö	0
STL 09/10:22	73	53	61	49	-99	29.87	Ö	Ŏ
STL 09/10:23	69	51	58	52	-99	29.88	Ö	Ö
STL 09/11:00	69	53	59	56	-99	29.89	Ŏ	Ö
STL 09/11:01	68	53	59	58	-99	29.9	3	240
STL 09/11:02	68	53	59	58	-99	29.9	3	240
STL 09/11:03	64	53	57	67	-99	29.91	5	230
STL 09/11:04	69	53	59	56	-99	29.92	3	220
STL 09/11:05	69	<b>5</b> 5	60	60	-99	29.93	0	0
STL 09/11:06	69	<b>\$</b> 5	60	60	-99	29.94	0	0
STL 09/11:07	69	<b>\$</b> 5	60	60	1014	29.96	7	230
STL 09/11:08	75	<b>5</b> 7	64	53	-99	29.97	7	230
STL 09/11:09	75	60	65	59	1015	29.99	9	240
STL 09/11:10	75	60	65	59	-99	30.01	12	240
STL 09/11:11	82	60	68	46	1015	30.01	15	240
STL 09/11:12	84	60	68	43	-99	30	18	260
STL 09/11:13	84	59	68	42	-99	29.99	15	230
STL 09/11:14	87	53	66	30	-99	29.98	22	250
STL 09/11:15	84	53	65	34	-99	29.97	12	260
STL 09/11:16	82	53	64	36	-99	29.96	10	200
STL 09/11:17	82	53	64	36	-99	29.95	9	180
STL 09/11:18	80	55	64	41	-99	29.96	12	170
STL 09/11:19	78	55	64	44	-99	29.97	12	180

hr = C.S.T. stn mo/dy:hr	Air Temp (°F)	DewPt Temp (°F)	WetBlb Temp (°F)	RH (%)	Press (mb)	Altimeter (in)	Wind Speed (mph)	Wind Dir (deg)
STL 09/11:20	77	59	65	53	-99	29.98	10	170
STL 09/11:21	73	59	64	61	-99	29.99	8	180
STL 09/11:22	73	59	64	61	-99	30	8	190
STL 09/11:23	71	57	62	61	-99	29.99	7	190

Note: Wind direction is reported in degrees: 0 = north, 90 = east, 180 = south, 270 = west. Note: -99 defines missing data.

Note: The data are in Central Standard Time.

# **TO-1 (volatiles) Sampler Calibration and Flow Rate Calculations**

**Site Information** 

Client:

Solutia

Location:

Sauget, IL

Operators:

RMN/DH

					Run	Run	Run	Run	Total	Volume	Volume	Avg	Avg	Volume
		Pre-cal	Post-cal	Average	Start	Start	Stop	Stop	Minutes	Sampled	Sampled	Temp	B.P.	Sampled
Location	Pump No.	(mlpm)	(mlpm)	(mlpm)	Date	Time	Date	Time	Sampled	(liters)	(m³)	(°F)	(inHg)	(stdm³)
Site H - DW#1	AC-22/2998	4.9	7.3	6.1	9/9/99	1910	9/10/99	1950	1480	9.0	0.00899	71	29.94	0.00910
Site H - DW#2	AC-27/3212	9.4	11.2	10.3	9/9/99	1845	9/10/99	1925	1480	15.2	0.0152	71	29.94	0.0154
Site H - UP#1	AC-36/3210	6.6	5.7	6.1	9/9/99	1928	9/10/99	2011	1483	9.1	0.00910	71	29.94	0.00921
Site I - DW#1	AC-15A/2849	5.1	3.9	4.5	9/9/99	1801	9/10/99	1824	1463	6.6	0.00661	71	29.94	0.00669
Site 1 - DW#2	2838	6.9	1.71	4.3	9/9/99	1728	9/10/99	1828	1500	6.5	0.00646	72	29.94	0.00652
Site I - UP#1	AC-25/2871	6.4	5.9	6.1	9/9/99	1819	9/10/99	1855	1476	9.0	0.00905	71	29.94	0.00916
Site G - DW#1	3144	4.8	10.8	7.8	9/10/99	0942	9/11/99	0943	1441	11.3	0.0113	75	29.91	0.0113
Site G - DW#2	AC-20/3222	5.9	5.6	5.7	9/10/99	1004	9/11/99	1004	1440	8.2	0.00824	75	29.91	0.00827
Site G - UP#1	AC-28/3211	6.8	3.6	5.2	9/10/99	1125	9/11/99	1125	1440	7.5	0.00751	76	29.91	0.00752
Site G - UP#2	AC-21/3213	6.2	5.4	5.8	9/10/99	1107	9/11/99	1107	1440	8.4	0.00838	76	29.91	0.00839
Site L - DW#1	AC-12/2842	9.1	11.2	10.1	9/10/99	1018	9/11/99	1018	1440	14.6	0.0146	75	29.91	0.0146
Site L - DW#2	AC-23/2994	7.3	4.0	5.7	9/10/99	1031	9/11/99	1031	1440	8.2	0.00816	75	29.91	0.00819
Site L - UP#1	AC-26/3208	7.2	5.5	6.4	9/10/99	1228	9/11/99	1228	1440	9.2	0.00915	76	29.91	0.00917

Notes:

mlpm = milliliters per minute

 $m^3$  = cubic meters

stdm<sup>3</sup> = standard cubic meters

# PM2.5 (metals) Sample Volumes

#### Site Information

Client:

Solutia

Location:

Sauget, IL

		Run	Run	Run	Run	Total	Volume
		Start	Start	Stop	Stop	Minutes	Sampled
Location	Unit No.	Date	Time	Date	Time	Sampled	(stdm³)
Site H - DW#1	4716	9/9/99	1858	9/10/99	1858	1440	24.0
Site H - DW#2	100507	9/9/99	1839	9/10/99	1839	1440	24.083
Site H - UP#1	4717	9/9/99	1920	9/10/99	1920	1440	24.0
Site I - DW#1	4713	9/9/99	1750	9/10/99	1750	1440	24.0
Site I - DW#2	4709	9/9/99	1725	9/10/99	1725	1440	24.0
Site I - UP#1	4711	9/9/99	1815	9/10/99	1815	1440	24.0
Site G - DW#1	4714	9/10/99	938	9/11/99	938	1440	23.53
Site G - DW#2	4712	9/10/99	955	9/11/99	955	1440	23.51
Site G - UP#1	PQ200	9/10/99	1133	9/11/99	1133	1440	23.19
Site G - UP#2	100508	9/10/99	1059	9/11/99	1059	1440	23.47
Site L - DW#1	4710	9/10/99	1017	9/11/99	1017	1440	23.52
Site L - DW#2	4715	9/10/99	1030	9/11/99	1030	1440	23.51
Site L - UP#1	100506	9/10/99	1230	9/11/99	1230	1440	23.997

Notes:

stdm<sup>3</sup> = standard cubic meters

Site Information		PUF	
Location: Sauget, IL		PUF Model No.:	TE-1000PUF
Date: 9/8/99		Blower Model No.:	TE-1004
Operator: RMN		Magnehelic Serial No.:	R9901155L9
Temperature (°F):	78	Sampler No.:	1
Temperature (°C):	26		
Temperature (K):	299		
Elevation (ft):	568 (Lambert airport)	Calibration Orific	ce
BP (in Hg):	29,9	Model No.:	TE-5040A
Pa (BP mm Hg):	759	Serial No.:	0099

 Qstd Slope (m):
 9.71704

 Qstd Intercept (b):
 -0.03242

			Sam	pler		
	Orific	ce			•	
	Flow	Qstd	Magn Flow	Mang Flow		
Run No.	("H2O)	(m3/min)	("H2O)	(ft³/min)	Linear Regression	on _
1	6.97	0.275	70	8.36		
2	6.00	0.255	60	7.74	slope	30.4
3	4.90	0.231	50	7.06	intercept	-0.01
4	4.05	0.210	40	6.32	coor. Coeff	0.9992
5	2.93	0.179	30_	5.47		
	sum(x)	1.150	sum(y)	34.94		
	sum(x) sq.	0.270	sum(y) sq	249		
			sum comb	8.21		
			n	5		
	sum(x)/n	0.230	sum(y)/n	6.99		
	sum(x)^2	1.32	sum(y)^2	1221		
			N.1 -	And the second section is a second of the se		0.000

Note: correlation coefficient should be greater than 0.990.

Calibration Date:

#### Post-calibraiton

Temperature (°F):	82
Temperature (°C):	28
Temperature (K):	301
BP (in Hg):	29.85
Pa (BP mm Hg):	758

		· · · · · · · · · · · · · · · · · · ·		Sample	er .	
	Orific	:0				
	Flow	Qstd	%	Magn Flow	Mang Flow	%
Run No.	("H2O)	(m3/ <u>m</u> in)	difference	("H2O)	(corrected)	difference
2	6.20	0.258	1.2	60	7.70	-0.5

#### Flow rate calculations:

Sampling date:

9/9/99-9/10/99

8/10/99

Location:	Site I, DW#2	m³/min	lpm	total m ³
Sampler flow	rate (m <sup>3</sup> /min) = 1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)	0.214	214	321
	m = sampler slope	30.4		
1	p = sampler intercept	-0.01		
1	magn = average magnehelic gage reading (inch H2O)	56		
;	average temperature during run (°F)	71		
-	Tav = average temperature (°K)	344		
;	average barometric pressure during run (in Hg)	29.96		
1	Pav = average pressure (mmHg)	761		
1	run start time	1724		
	run end time	1824		
t	otal run time (minutes)	1500		

Site Information		PUF	
Location: Sauget, IL		PUF Model No.:	TE-1000PUF
Date: 9/8/99		Blower Model No.:	TE-1004
Operator: JDB		Magnehelic Serial No.:	R9903224L37
Temperature (°F):	8	Sampler No.:	2
Temperature (°C):	6		
Temperature (K): 29	9		
Elevation (ft): 56	8 (Lambert airport)	Calibration Orific	ce
BP (in Hg): 29	9	Model No.:	TE-5040A
Pa (BP mm Hg): 75	9	Serial No.:	0101
		Calibration Date:	8/10/99
		Qstd Slope (m):	9.47526

Qstd Intercept (b):

Pre-calibration

		oler	Samp			
			•	e	Orific	
		Mang Flow	Magn Flow	Qstd	Flow	
	Linear Regression	(corrected)	("H2O)	(m3/min)	("H2O)	Run No.
		8.36	70	0.278	6.70	1
29	slope	7.74	60	0.256	5.70	2
0.0	intercept	7.06	50	0.238	4.90	3
0.998	coor. Coeff	6.32	40	0.207	3.70	4
		5.47	30	0.182	2.82	5
		34.94	sum(y)	1.161	sum(x)	
		249	sum(y) sq	0.275	sum(x) sq.	S
		8.29	sum comb			
		5	n			
		6.99	sum(y)/n	0.232	sum(x)/n	
		1221	sum(y)^2	1.35	sum(x)^2	

#### Post-calibraiton

 Temperature (°F):
 82

 Temperature (°C):
 28

 Temperature (K):
 301

 BP (in Hg):
 29.85

 Pa (BP mm Hg):
 758

				Sample	91	
	Orific	:е		-		
	Flow	Qstd :	%	Magn Flow	Mang Flow	%
Run No.	("H2O)	(m3/min)	difference	("H2O)	(corrected)	difference
3	4.80	0.235	-1.5	50	7.03	-0.5

-0.044390

Sampling date:	9/9/99-9/10/99			
Location:	Site H, DW#2	m³/min	lpm	total m ³
Sampler flow rate (m	<sup>3</sup> /min) = 1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)	0.212	212	313
m ≈ samp	oler slope	29.8		
b = samp	er intercept	0.07		
magn = a	verage magnehelic gage reading (inch H2O)	54		
average t	emperature during run (°F)	72		
Tav = ave	rage temperature (°K)	345		
average b	parometric pressure during run (in Hg)	29.93		
Pav = ave	erage pressure (mmHg)	760		
run start t	ime (ET 0.44)	1843		
run end ti	me (24.91)	1922		
total run t	ime (minutes)	1479		

Site Information

Sauget, IL PUF Model No.:

Location: 9/8/99 Blower Model No.: TE-1000PUF

Date: AJC Operator: Magnehelic Serial No.: TE-1004

78 Temperature (°F): Sampler No.: R990610ML80

26 Temperature (°C): 299

Temperature (K): Elevation (ft):

568 (Lambert airport)

**Calibration Orifice** 

**PUF** 

BP (in Hg):

Model No.: Serial No.:

TE-5040A

29.9 759 Pa (BP mm Hg):

Calibration Date:

0098

Qstd Slope (m):

8/10/99

9.57809

Qstd Intercept (b):

-0.030300

Pre-calibration

			Sam	pler		
	Orific	ce				
Run No.	Flow ("H2O)	Qstd (m3/min)	Magn Flow ("H2O)	Mang Flow (corrected)	Linear Regressio	n
1	6.85	0.276	70	8.36		
2	6.10	0.261	60	7.74	slope	30.4
3	5.15	0.240	50	7.06	intercept	-0.15
4	4.10	0.214	40	6.32	coor. Coeff	0.9972
5	2.95	0.182	30	5.47		
	sum(x)	1.173	sum(y)	34.94		
;	sum(x) sq.	0.281	sum(y) sq	249		
			sum comb	8.37		
			n	5		
	sum(x)/n	0.235	sum(y)/n	6.99		
	sum(x)^2	1.38	sum(y)^2	1221		

Post-calibraiton

Temperature (°F): 82 28 Temperature (°C): Temperature (K): 301 BP (in Hg): 29.85 Pa (BP mm Hg): 758

				Sample	ər	
	Orific	:е		·		
	Flow	Qstd	%	Magn Flow	Mang Flow	%
Run No.	("H2O)	(m3/min)	difference	("H2O)	(corrected)	difference
2	6.30	0.264	1.1	60	7.70	-0.5

Sampling date	9/9/99-9/10/99			
Location:	Site I, DW#1	m³/min	lpm	total m³
Sampler flow r	rate (m <sup>3</sup> /min) = 1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)	0.222	222	286
m :	= sampler slope	30.4		
b =	sampler intercept	-0.15		
ma	gn = average magnehelic gage reading (inch H2O)	59		
ave	erage temperature during run (°F)	73		
Ta	v = average temperature (°K)	346		
ave	erage barometric pressure during run (in Hg)	29.93		
Pa	v = average pressure (mmHg)	760		
run	start time (ET 0.32)	1750		
run	end time (ET 21.79)	1820		
tota	al run time (minutes) (ET 21.47)	1288		

78

26

568 (Lambert airport)

299

29.9

759

Site	Information	
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Sauget, IL 9/8/99

Date: **JWP** Operator:

Temperature (°F): Temperature (°C): Temperature (K):

Elevation (ft): BP (in Hg):

Pa (BP mm Hg):

Location:

PUF

PUF Model No.: Blower Model No.:

TE-1004 R990615R9 Magnehelic Serial No.:

Sampler No.:

TE-1000PUF

**Calibration Orifice** 

Model No.: Serial No.:

TE-5040A 0099

Calibration Date: Qstd Slope (m):

8/10/99 9.71704

Qstd Intercept (b):

-0.032420

#### Pre-calibration

	··· ···		Sam	pier		
	Orific	e [				
	Flow	Qstd	Magn Flow	Mang Flow		
Run No.	("H2O)	(m3/min)	("H2O)	(corrected)	Linear Regressi	on
1	6.55	0.266	70	8.36		
2	5.95	0.254	60	7.74	slope	30.0
3	4.95	0.232	50	7.06	intercept	0.19
4	3.95	0.208	40	6.32	coor. Coeff	0.9935
5	2.70	0.172	30	5.47		
	sum(x)	1.132	sum(y)	34.94		
;	sum(x) sq.	0.262	sum(y) sq	249		
			sum comb	8.08		
			n	5		
	sum(x)/n	0.226	sum(y)/n	6.99		
	sum(x)^2	1.28	sum(y)^2	1221		

#### Post-calibraiton

82 Temperature (°F): Temperature (°C): 28 Temperature (K): 301 BP (in Hg): 29.85 Pa (BP mm Hg): 758

		<del></del>		Sample	er	
	Orific	:e :		•		
	Flow	Qstd	%	Magn Flow	Mang Flow	%
Run No.	("H2O)	(m3/min)	difference	("H2O)	(corrected)	difference
2	5.80	0.250	-1.7	60	7.70	-0.5

Sampling dat	e: 9/9/99-9/10/99			_
Location:	Site I, DW#2	m³/min	lpm	total m <sup>3</sup>
Sampler flow	rate (m <sup>3</sup> /min) = 1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)	0.217	217	325
m	n = sampler slope	30.0		
b	= sampler intercept	0.19		
m	agn = average magnehelic gage reading (inch H2O)	60		
a	verage temperature during run (°F)	72		
T	av = average temperature (°K)	344.5		
a	verage barometric pressure during run (in Hg)	29.95		
P	av = average pressure (mmHg)	761		
ru	ın start time	1726		
ru	in end time	1823		
to	tal run time (minutes)	1497		

Site Information	6	PUF		
Location: Sauget, IL		PUF Model No.:	TE-1000PUF	
Date: 9/8/99	:	Blower Model No.:	TE-1004	
Operator: AJC	i I	Magnehelic Serial No.:	R990610TR1	
Temperature (°F):	78	Sampler No.:	5	
Temperature (°C):	26			
Temperature (K):	299			
Elevation (ft):	56\$ (Lambert airport)	Calibration Orific	е	
BP (in Hg):	29.9	Model No.:	TE-5040A	
Pa (BP mm Hg):	759	Serial No.:	0098	
		Calibration Date:	8/10/99	
		Qstd Slope (m):	9.57809	
		Qstd Intercept (b):	-0.030300	

#### Pre-calibration

: 1

	oler	Samp	1		
		•	e	Orific	
	Mang Flow	Magn Flow	Qstd	Flow	
Linear	(corrected)	("H2O)	(m3/min)	("H2O)	Run No.
	8.36	70	0.278	6.95	1
slope	7.74	60	0.263	6.20	2
interce	7.06	50	0.242	5.25	3
coor. C	6.32	40	0.214	4.10	4
	5.47	30	0.187	3.10	5
	34.94	sum(y)	1.184	sum(x)	
	249	sum(y) sq	0.286	sum(x) sq.	S
	8.44	sum comb			
	5	n			
	6.99	sum(y)/n	0.237	sum(x)/n	
	1221	sum(y)^2	1.40	$sum(x)^2$	

#### Post-calibraiton

Temperature (°F):	80
Temperature (°C):	27
Temperature (K):	300
BP (in Hg):	29.86
Pa (BP mm Hg):	758
- 1- 0/	

-				Sample	ЭГ	_
	Orific	e		_		
	Flow	Qstd :	%	Magn Flow	Mang Flow	%
Run No.	("H2O)	(m3/min)	difference	("H2O)	(corrected)	difference
2	6.00	0.258	-1.9	60	7.72	-0.3

Sampling date:	9/9/99-9/10/99			
Location:	Site I, UP#1	m³/min	lpm	total m <sup>3</sup>
Sampler flow ra	ate (m <sup>3</sup> /min) = 1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)	0.223	223	328
m =	sampler slope	30.9		
b =	sampler intercept	-0.33		
mag	gn = average magnehelic gage reading (inch H2O)	57		
ave	rage temperature during run (°F)	71		
Tav	= average temperature (°K)	344		
ave	rage barometric pressure during run (in Hg)	29.94		
Pav	= average pressure (mmHg)	760		
run	start time	1819		
run	end time	1854		
tota	I run time (minutes)	1475		

Sauget, IL

Location: Date: Operator:

9/8/99

**JWP** 

Temperature (°F): Temperature (°C):

Temperature (K): Elevation (ft):

BP (in Hg): Pa (BP mm Hg):

78 26 299

568 (Lambert airport)

29.9 759

PUF

PUF Model No.:

TE-1000PUF

Blower Model No.:

TE-1004

Magnehelic Serial No.:

R990615TR24

Sampler No.:

**Calibration Orifice** 

Model No.: Serial No.:

TE-5040A 0098

Calibration Date:

8/10/99

Qstd Slope (m):

9.57809

Qstd Intercept (b):

-0.030300

#### Pre-calibration

		oler	Samp	<b>\</b>		
				e	Orific	
		Mang Flow	Magn Flow	Qstd	Flow	
	Linear Regression	(corrected)	("H2O)	(m3/min)	("H2O)	Run No.
		8.36	70	0.279	7.00	1
31	slope	7.74	60	0.262	6.15	2
-0.4	intercept	7.06	50	0.244	5.35	3
0.996	coor. Coeff	6.32	40	0.218	4.25	4
		5.47	30	0.187	3.10	_ 5
	•	34.94	sum(y)	1.190	sum(x)	
		249	sum(y) sq	0.289	sum(x) sq.	5
		8.48	sum comb			
		5	n			
		6.99	sum(y)/n	0.238	sum(x)/n	
		1221	sum(y)^2	1.42	sum(x)^2	

#### Post-calibraiton

Temperature (°F): 82 28 Temperature (°C): Temperature (K): 301 BP (in Hg): 29.85 Pa (BP mm Hg): 758

	<del></del>		T	Sample	er	<del></del>
	Orific	:е				
	Flow	Qstd	%	Magn Flow	Mang Flow	%
Run No.	("H2O)	(m3/min)	difference	("H2O)	(corrected)	difference
2	5.80	0.253	-3.4	60	7.70	-0.5

Sampling date:	9/9/99-9/10/99			
Location:	Site I, UP#1	m³/min	lpm	total m ³
Sampler flow rate (m	/min) = 1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)	0.224	224	331
m = samp	ler slope	31.2		
b = sample	er intercept	-0.43		
magn = av	verage magnehelic gage reading (inch H2O)	58		
average to	emperature during run (°F)	72		
Tav = ave	rage temperature (°K)	344.6		
average b	arometric pressure during run (in Hg)	29.93		
Pav = ave	rage pressure (mmHg)	760		
run start ti	me	1818		
run end tir	ne	1853		
total run ti	me (minutes)	1475		

Site Information	i	PUF	
Location: Sauget, IL		PUF Model No.:	TE-1000PUF
Date: 9/8/99		Blower Model No.:	TE-1004
Operator: JWP		Magnehelic Serial No.:	R990616ML6
Temperature (°F):	78	Sampler No.:	7
Temperature (°C):	26		
Temperature (K):	299		
Elevation (ft):	568 (Lambert airport)	Calibration C	rifice
BP (in Hg):	29.9	Model No.:	TE-5040A
Pa (BP mm Hg):	759	Serial No.:	0099
		Calibration Date:	8/10/99
		Qstd Slope (m):	9.71704
		Qstd Intercept (b):	-0.032420

#### Pre-calibration

		oler	Samp			
				e	Orific	
		Mang Flow	Magn Flow	Qstd	Flow	
	Linear Regression	(corrected)	("H2O)	(m3/min)	("H2O)	Run No.
·		8.36	70	0.282	7.35	1
33.	slope	7.74	60	0.265	6.50	2
-1.0	intercept	7.06	50	0.244	5.50	3
0.999	coor. Coeff	6.32	40	0.221	4.50	4
		5.47	30	0.196	3.50	5
		34.94	sum(y)	1.209	sum(x)	
		249	sum(y) sq	0.297	sum(x) sq.	S
		8.60	sum comb			
		5	n			
		6.99	sum(y)/n	0.242	sum(x)/n	
		1221	sum(y)^2	1.46	sum(x)^2	

#### Post-calibraiton

 Temperature (°F):
 82

 Temperature (°C):
 28

 Temperature (K):
 301

 BP (in Hg):
 29.85

 Pa (BP mm Hg):
 758

				Sample	er	
	Orific	:e		-		
	Flow	Qstd	%	Magn Flow	Mang Flow	%
Run No.	("H2O)	(m3/min)	difference	("H2O)	(corrected)	difference
2	6.30	0.260	-2.0	60	7.70	-0.5

Sampling da	ate: 9/9/99-9/10/99	_		_
Location:	Site I, DW#1	m³/min	lpm	total m <sup>3</sup>
Sampler flow rate $(m^3/min) = 1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)$		0.218	218	323
r	m = sampler slope	33.1		
t	p = sampler intercept	-1.02		
r	magn = average magnehelic gage reading (inch H2O)	52		
a	average temperature during run (°F)	73		
٦	Fav = average temperature (°K)	346		
a	average barometric pressure during run (in Hg)	29.93		
F	Pav = average pressure (mmHg)	760		
r	un start time (ET 25.46)	1745		
r	un end time (ET 0.31)	1822		
t	otal run time (minutes)	1477		

Site	Information	i

Sauget, IL

PUF Model No.: Blower Model No.: TE-1000PUF

Location: Date: Operator:

9/8/99 **JWP**  Magnehelic Serial No.:

TE-1004

Temperature (°F):

78

R9906151R43

Temperature (°C):

26

Sampler No.:

Temperature (K):

299 568 (Lambert airport)

**Calibration Orifice** 

**PUF** 

Elevation (ft): BP (in Hg):

Pa (BP mm Hg):

29.9 759

Model No.: Serial No.:

TE-5040A

Calibration Date:

0100

8/10/99

Qstd Slope (m):

9.55896

Qstd Intercept (b):

-0.054620

#### Pre-calibration

		oler	Samp			
			_	е	Orific	
		Mang Flow	Magn Flow	Qstd	Flow	
	Linear Regression	(corrected)	("H2O)	(m3/min)	("H2O)	Run No.
	· -	8.36	70	0.267	6.25	1
31.0	slope	7.74	60	0.251	5.50	2
-0.02	intercept	7.06	50	0.235	4.80	3
0.9953	coor. Coeff	6.32	40	0.204	3.60	4
		5.47	30	0.176	2.65	5
		34.94	sum(y)	1.132	sum(x)	
		249	sum(y) sq	0.262	sum(x) sq.	5
		8.08	sum comb			
		5	n			
		6.99	sum(y)/n	0.226	sum(x)/n	
		1221	sum(y)^2	1.28	sum(x)^2	

#### Post-calibraiton

Temperature (°F): 82 Temperature (°C): 28 Temperature (K): 301 BP (in Hg): 29.85 Pa (BP mm Hg): 758

				Sample	er	
	Orific	e				
	Flow	Qstd	%	Magn Flow	Mang Flow	%
Run No.	("H2O)	(m3/min)	difference	("H2O)	(corrected)	difference
2	5.40	0.247	-1.3	60	7.70	-0.5

Sar	mpling date:	9/9/99-9/10/99			
Loc	ation:	Site I, DW#2	m³/min	lpm	total m ³
Sar	mpler flow rate (m	n <sup>3</sup> /min) = 1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)	0.209	209	313
	m = sam	pler slope	31.0		
	b = samp	oler intercept	-0.02		
	magn = a	average magnehelic gage reading (inch H2O)	55		
	average	temperature during run (°F)	72		
	Tav = av	erage temperature (°K)	345		
	average l	barometric pressure during run (in Hg)	29.95		
	Pav = av	erage pressure (mmHg)	761		
	run start	time (ET 0.31)	1725		
	run end t	ime (ET 25.30)	1824		
	total run t	time (minutes)	1499		

• • •			
Site	Into	rmation	

Sauget, IL

Operator: Temperature (°F):

Temperature (°C): Temperature (K): Elevation (ft):

Location:

Date:

BP (in Hg): Pa (BP mm Hg):

9/8/99 **JWB** 

> 299 568 (Lambert airport)

29.9 759

78

26

**PUF** 

PUF Model No.: Blower Model No.: TE-1000PUF TE-1004

Magnehelic Serial No.:

R990615TR22

Sampler No.:

**Calibration Orifice** 

Model No.: Serial No.:

TE-5040A 0098

Calibration Date:

8/10/99

Qstd Slope (m):

9.57809

Qstd Intercept (b):

-0.030300

#### Pre-calibration

		oler	Samp			
				e	Orific	
		Mang Flow	Magn Flow	Qstd	Flow	
	Linear Regression	(corrected)	("H2O)	(m3/min)	("H2O)	Run No.
		8.36	70	0.273	6.70	1
29.7	slope	7.74	60	0.258	5.95	2
0.12	intercept	7.06	50	0.239	5.10	3
0.9959	coor. Coeff	6.32	40	0.206	3.80	4
		5.47	30	0.179	2.85	5
		34.94	sum(y)	1.155	sum(x)	
		249	sum(y) sq	0.273	sum(x) sq.	S
		8.24	sum comb			
		5	n			
		6.99	sum(y)/n	0.231	sum(x)/n	
		1221	sum(y)^2	1.33	sum(x)^2	

#### Post-calibraiton

Temperature (°F): Temperature (°C): Temperature (K): BP (in Hg):

0.238

Orifice

Flow

5.10

("H2O)

Pa (BP mm Hg):

Run No.

3

		Sample	er	
Qstd	%	Magn Flow	Mang Flow	%
(m3/min)	difference	("H2O)	(corrected)	difference

50

7.03

-0.5

-0.4

Sampling da	ate: 9/9/99-9/10/99			
Location:	Site I, DW#1	m³/min	lpm	total m ³
Sampler flow rate $(m^3/min) = 1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)$		0.221	221	323
r	m = sampler slope	29.7		
ŀ	p = sampler intercept	0.12		
r	magn = average magnehelic gage reading (inch H2O)	60		
á	average temperature during run (°F)	72		
٦	Fav = average temperature (°K)	345		
a	average barometric pressure during run (in Hg)	29.94		
F	Pav = average pressure (mmHg)	760		
г	run start time (ET 0.17)	1802		
r	un end time (ET 25.05)	1822		
t	otal run time (minutes)	1460		

Site Information		PUF	
Location: Sauget, IL		PUF Model No.:	TE-1000PUF
Date: 9/8/99		Blower Model No.:	TE-1004
Operator: JWP		Magnehelic Serial No.:	R9804016F24
Temperature (°F):	78	Sampler No.:	10
Temperature (°C):	26		
Temperature (K):	99		
Elevation (ft):	68 (Lambert airport)	Calibration Orifi	ice
BP (in Hg):	9.9	Model No.:	TE-5040A
Pa (BP mm Hg):	59	Serial No.:	0101
		Calibration Date:	8/10/99
		Qstd Slope (m):	9.47526
		Qstd Intercept (b):	-0.044390

Pre-ca	librait	on
--------	---------	----

		oler	Samp			
				e	Orific	
	Linear Regression	Mang Flow (corrected)	Magn Flow ("H2O)	Qstd (m3/min)	Flow ("H2O)	Run No.
		8.36	70	0.274	6.55	1
31.5	slope	7.74	60	0.257	5.75	2
-0.37	intercept	7.06	50	0.239	4.95	3
0.9982	coor. Coeff	6.32	40	0.211	3.85	4
		5.47	30	0.184	2.90	5
		34.94	sum(y)	1.167	sum(x)	
		249	sum(y) sq	0.277	sum(x) sq.	S
		8.32	sum comb			
		5	п			
		6.99	sum(y)/n	0.233	sum(x)/n	
		1221	sum(y)^2	1.36	sum(x)^2	

## Post-calibraiton

Temperature (°F):	82
Temperature (°C):	28
Temperature (K):	301
BP (in Hg):	29.85
Pa (BP mm Hg):	758

	<del></del> ·	*		Sample	er	
	Orific	:e		•		
	Flow	Qstd =	%	Magn Flow	Mang Flow	%
Run No.	("H2O)	(m3/min)	difference	("H2O)	(corrected)	difference
2	5.25	0.245	-5.0	60	7.70	-0.5

Sampling date	9/9/99-9/10/99	•		
Location:	Site H, DW#2	m³/min	lpm	total m³
Sampler flow I	rate $(m^3/min) = 1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)$	0.222	222	329
m	= sampler slope	31.5		
b =	sampler intercept	-0.37		
ma	agn = average magnehelic gage reading (inch H2O)	58		
ave	erage temperature during run (°F)	71		
Ta	v = average temperature (°K)	344		
ave	erage barometric pressure during run (in Hg)	29.94		
Pa	v = average pressure (mmHg)	760		
rur	n start time	1841		
rur	end time	1923		
tota	al run time (minutes)	1482		

Site Information	PUF

 Location:
 Sauget, IL
 PUF Model No.:
 TE-1000PUF

 Date:
 9/8/99
 Blower Model No.:
 TE-1004

 Operator:
 JWP
 Magnehelic Serial No.:
 R990118ML26

Operator:JWPMagnehelic Serial No.:R990118ML26Temperature (°F):78Sampler No.:11Temperature (°C):26

Temperature (K): 299
Elevation (ft): 568 (Lambert airport) Calibration Orifice

 BP (in Hg):
 29.9
 Model No.:
 TE-5040A

 Pa (BP mm Hg):
 759
 Serial No.:
 0098

 Calibration Date:
 8/10/99

 Qstd Slope (m):
 9.57809

 Qstd Intercept (b):
 -0.030300

#### Pre-calibration

		oler	Samp	]		
			_	e	Orific	
		Mang Flow	Magn Flow	Qstd	Flow	
	Linear Regression	(corrected)	("H2O)	(m3/min)	("H2O)	Run No.
		8.36	70	0.274	6.75	1
30.	slope	7.74	60	0.254	5.80	2
0.0	intercept	7.06	50	0.236	5.00	3
0.997	coor. Coeff	6.32	40	0.212	4.00	4
		5.47	30	0.178	2.80	5
		34.94	sum(y)	1.154	sum(x)	
		249	sum(y) sq	0.272	sum(x) sq.	5
		8.24	sum comb			
		5	n			
		6.99	sum(y)/n	0.231	sum(x)/n	
		1221	sum(y)^2	1.33	sum(x)^2	

#### Post-calibraiton

 Temperature (\*F):
 80

 Temperature (\*C):
 27

 Temperature (K):
 300

 BP (in Hg):
 29.87

 Pa (BP mm Hg):
 759

		· · · · · · · · · · · · · · · · · · ·		Sample	er	<del></del>
	Orific	e		·		
	Flow	Qstd	%	Magn Flow	Mang Flow	%
Run No.	("H2O)	(m3/min)	difference	("H2O)	(corrected)	difference
2	5.80	0.254	-0.2	60	7.72	-0.2

Sampling da	ite: 9/9/99-9/10/99			
Location:	Site H, DW#1	m³/min	lpm	total m <sup>3</sup>
Sampler flow	v rate (m <sup>3</sup> /min) = 1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)	0.216	216	321
r	n ≈ sampler slope	30.2		
t	e = sampler intercept	0.01		
r	nagn = average magnehelic gage reading (inch H2O)	57		
a	everage temperature during run (°F)	71		
٦	Tav = average temperature (°K)	344		
a	everage barometric pressure during run (in Hg)	29.94		
F	Pav = average pressure (mmHg)	760		
r	un start time	1902		
r	un end time	1947		
t	otal run time (minutes)	1485		

Site Information	PUF
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 Location:
 Sauget, IL
 PUF Model No.:
 TE-1000PUF

 Date:
 9/8/99
 Blower Model No.:
 TE-1004

 Operator:
 JDB
 Magnehelic Serial No.:
 R990118ML2

Temperature (°F): 78 Sampler No.: 12
Temperature (°C): 26

Temperature (K): 299
Elevation (ft): Calibration Orifice

 BP (in Hg):
 29.9
 Model No.:
 TE-5040A

 Pa (BP mm Hg):
 759
 Serial No.:
 0101

Pre-calibration

			Sam	pler		
	Orific	ce				
Run No.	Flow ("H2O)	Qstd (m3/min)	Magn Flow ("H2O)	Mang Flow (corrected)	Linear Regressio	n
1	6.50	0.273	70	8.36		
2	5.65	0.255	60	7.74	slope	31.1
3	4.85	0.237	50	7.06	intercept	-0.21
4	3.80	0.210	40	6.32	coor. Coeff	0.9985
5	2.80	0.181	30	5.47		
	sum(x)	1.157	sum(y)	34.94		
	sum(x) sq.	0.273	sum(y) sq	249		
			sum comb	8.25		
			n	5		
	sum(x)/n	0.231	sum(y)/n	6.99		
	$sum(x)^2$	1.34	sum(y)^2	1221		

#### Post-calibraiton

 Temperature (°F):
 80

 Temperature (°C):
 27

 Temperature (K):
 300

 BP (in Hg):
 29.86

 Pa (BP mm Hg):
 758

				Sample	er	
	Orific	e				
	Flow	Qstd	%	Magn Flow	Mang Flow	%
Run No.	("H2O)	(m3/min)	difference	("H2O)	(corrected)	difference
2	5.30	0.247	-3.4	60	7.72	-0.3

Sampling date:	9/9/99-9/10/99			
Location:	Site I, UP#1	m³/min	lpm	total m³
Sampler flow rat	te (m³/min) = 1/m([Sqrt(magn)(Pav/760)(298/Tav)}-b)	0.218	218	321
m =	sampler slope	31.1		
b = s	sampler intercept	-0.21		
mag	n = average magnehelic gage reading (inch H2O)	58		
aver	age temperature during run (°F)	72		
Tav	= average temperature (°K)	345		
ачег	age barometric pressure during run (in Hg)	29.93		
Pav	= average pressure (mmHg)	760		
run s	start time	1816		
run e	end time	1852		
total	run time (minutes)	1476		

Site Information

Sauget, IL

PUF Model No.:

Sampler No.:

TE-1000PUF

Location: Date:

9/8/99 JWP Blower Model No.: Magnehelic Serial No.: TE-1004

Operator: Temperature (°F):

78

R990322ML36

Temperature (°C):

26

13

Temperature (K):

299

**PUF** 

Elevation (ft):

568 (Lambert airport)

**Calibration Orifice** 

BP (in Hg):

Pa (BP mm Hg):

29.9

Model No.:

TE-5040A

759

Serial No.:

0101

Calibration Date:

8/10/99

Qstd Slope (m):

9.47526

Ostd Intercept (b):

-0.044390

Pre-calibration

			Sam	pler		
	Orific	ce				
Run No	Flow ("H2O)	Qstd (m3/min)	Magn Flow ("H2O)	Mang Flow (corrected)	Linear Regression	1
1	6.70	0.278	70	8.36		
2	6.05	0.264	60	7.74	slope	29.1
3	5.05	0.242	50	7.06	intercept	0.12
4	4.10	0.218	40	6.32	coor. Coeff	0.9926
5	2.75	0.179	30	5.47		
·····	sum(x)	1.181	sum(y)	34.94		
3	sum(x) sq.	0.285	sum(y) sq	249		
			sum comb	8.43		
			n	5		
	sum(x)/n	0.236	sum(y)/n	6.99		
	sum(x)^2	1.39	$sum(y)^2$	1221		

#### Post-calibraiton

Pa (BP mm Hg):

Temperature (°F): Temperature (°C): Temperature (K): BP (in Hg):

	r	Sample				
		•		e ·	Orific	
%	Mang Flow	Magn Flow	%	Qstd	Flow	
difference	(corrected)	("H2O)	difference	(m3/min)	("H2O)	Run No.
0.5	7 77	60	5.7	0.250	5.25	2

75

24

297

762

30.01

0.5

Sampling date:	9/10/99-9/11/99			
Location:	Site G, DW#1	m³/min	lpm	total m <sup>3</sup>
Sampler flow rate (m <sup>3</sup>	/min) = 1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)	0.218	218	314
m = sampl	er slope	29.1		
b = sample	er intercept	0.12		
magn = av	erage magnehelic gage reading (inch H2O)	58		
average te	mperature during run (°F)	77		
Tav = aver	age temperature (°K)	350		
average ba	arometric pressure during run (in Hg)	29.94		
Pav = aver	age pressure (mmHg)	761		
run start tir	me	939		
run end tim	ne	938		
total run tir	ne (minutes)	1439		

C:4-	Information	
Site	Information	

Sauget, IL

PUF Model No.:

TE-1000PUF

Location: Date:

9/8/99 **JWP**  Blower Model No.:

TE-1004

Operator: Temperature (°F):

78

R990115ML24

26

Magnehelic Serial No.: Sampler No.:

PUF

14

Temperature (°C):

Temperature (K): Elevation (ft):

299 568 (Lambert airport)

**Calibration Orifice** 

Model No.:

TE-5040A

BP (in Hg): Pa (BP mm Hg): 29.9 759

Serial No.:

0098

Calibration Date:

Qstd Slope (m):

8/10/99

9.57809

Qstd Intercept (b):

-0.030300

#### Pre-calibration

			Sam	pler	· · · · · · · · · · · · · · · · · · ·	
	Orific	ce				
	Flow	Qst#	Magn Flow	Mang Flow		
Run No.	("H2O)	(m3/min)	("H2O)	(corrected)	Linear Regression	1
1	7.05	0.280	70	8.36		
2	6.05	0.260	60	7.74	slope	30.8
3	5.20	0.241	50	7.06	intercept	-0.30
4	4.20	0.217	40	6.32	coor. Coeff	0.9987
5	3.05	0.185	30	5.47		
	sum(x)	1.183	sum(y)	34.94		
S	sum(x) sq.	0.285	sum(y) sq	249		
			sum comb	8.43		
			n	5		
	sum(x)/n	0.237	sum(y)/n	6.99		
	sum(x)^2	1.40	$sum(y)^2$	1221		

#### Post-calibraiton

Temperature (°F): 80 27 Temperature (°C): 300 Temperature (K): BP (in Hg): 29.87 Pa (BP mm Hg): 759

				Sample	er	
	Orific	e:e				
	Flow	Qstd	%	Magn Flow	Mang Flow	%
Run No.	("H2O)	(m3/min)	difference	("H2O)	(corrected)	difference
2	6.10	0.260	0.2	60	7.72	-0.2

Sampling date:	9/9/99-9/10/99			
Location:	Site H, DW#1	m³/min	lpm	total m <sup>3</sup>
Sampler flow rate (m <sup>3</sup> )	/min) = 1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)	0.216	216	320
m = sample	er slope	30.8		
b = sample	r intercept	-0.30		
magn = ave	erage magnehelic gage reading (inch H2O)	54		
average ter	mperature during run (°F)	71		
Tav = avera	age temperature (°K)	344		
average ba	rometric pressure during run (in Hg)	29.94		
Pav = avera	age pressure (mmHg)	760		
run start tim	ne	1902		
run end tim	e	1946		
total run tim	ne (minutes)	1484		

Site Information		PUF	
Location: Sauget, IL		PUF Model No.:	TE-1000PUF
Date: 9/8/99		Blower Model No.:	TE-1004
Operator: JWP		Magnehelic Serial No.:	R990615ML40
Temperature (°F):	78	Sampler No.:	15
Temperature (°C):	26		
Temperature (K):	299		
Elevation (ft):	56B (Lambert airport)	Calibration (	<b>Drifice</b>
BP (in Hg):	29.9	Model No.:	TE-5040A
Pa (BP mm Hg):	759	Serial No.:	0098
		Calibration Date:	8/10/99
		Qstd Slope (m):	9.57809
		Qstd Intercept (b):	-0.030300

#### **Pre-calibration**

			Sam	pler	<del>-</del>	
	Orific	e			•	
	Flow	Qstd	Magn Flow	Mang Flow		
Run No.	("H2O)	(m3/min)	("H2O)	(corrected)_	Linear Regression	n
1	6.90	0.277	70	8.36		
2	6.15	0.262	60	7.74	slope	31.7
3	5.25	0.242	50	7.06	intercept	-0.54
4	4.25	0.218	40	6.32	coor. Coeff	0.9972
5	3.10	0.187	30	5.47		
	sum(x)	1.186	sum(y)	34.94		
;	sum(x) sq.	0.286	sum(y) sq	249		
			sum comb	8.45		
			n	5		
	sum(x)/n	0.237	sum(y)/n	6.99		
	$sum(x)^2$	1.41	sum(y)^2	1221		

#### Post-calibraiton

Temperature (°F):	80
Temperature (°C):	27
Temperature (K):	300
BP (in Hg):	29.86
Pa (BP mm Hg):	758

, <del>7</del> d.				Sample	er	
	Orific	:е	ļ	•		
	Flow	Qstd	%	Magn Flow	Mang Flow	%
Run No.	("H2O)	(m3/min)	difference	("H2O)	(corrected)	difference
2	6.05	0.259	-1.1	60	7.72	-0.3

Sampling date:	9/9/99-9/10/99			
Location:	Site H, DW#2	m³/min	lpm	total m <sup>3</sup>
Sampler flow rate (n	n <sup>3</sup> /min) = 1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)	0.212	212	314
m = sam	pler slope	31.7		
b = samp	oler intercept	-0.54		
magn = a	average magnehelic gage reading (inch H2O)	51		
average	temperature during run (°F)	71		
Tav = av	erage temperature (°K)	344		
average	barometric pressure during run (in Hg)	29.94		
Pav = av	erage pressure (mmHg)	760		
run start	time	1843		
run end t	ime	1924		
total run	time (minutes)	1481		

Site Information
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PUF PUF Model No.:

Location: Date: Operator:

Temperature (°F):

Sauget, IL 9/8/99 **JWP** 

29.9

759

78 26

Temperature (°C): Temperature (K): 299 568 (Lambert airport) Elevation (ft):

BP (in Hg): Pa (BP mm Hg): Blower Model No.: Magnehelic Serial No.: Sampler No.:

TE-1004 R990615ML14

TE-1000PUF

16

**Calibration Orifice** 

Model No.: Serial No.:

TE-5040A 0100

Calibration Date:

8/10/99

Qstd Slope (m):

9.55896

Qstd Intercept (b):

-0.054620

### Pre-calibration

		oler	Samp	1		
			_	e	Orific	
		Mang Flow	Magn Flow	Qstd	Flow	
	Linear Regression	(corrected)	("H2O)	(m3/min)	("H2O)	Run No.
		8.36	70	0.272	6.50	1
33	slope	7.74	60	0.259	5.90	2
-0.8	intercept	7.06	50	0.246	5.30	3
0.98	coor. Coeff	6.32	40	0.217	4.10	4
		5.47	30	0.188	3.05	5
		34.94	sum(y)	1.183	sum(x)	
		249	sum(y) sq	0.285	sum(x) sq.	5
		8.42	sum comb			
		5	n			
		6.99	sum(y)/n	0.237	sum(x)/n	
		1221	sum(y)^2	1.40	sum(x)^2	

#### Post-calibraiton

80 Temperature (°F): 27 Temperature (°C): Temperature (K): 300 BP (in Hg): 29.87 Pa (BP mm Hg): 759

				Sample	ər	
	Orific	:е		•		
	Flow	Qstd	%	Magn Flow	Mang Flow	%
Run No.	("H2O)	(m3/min)	difference	("H2O)	(corrected)	difference
2	5.80	0.257	-1.1	60	7.72	-0.2

Sampling date:	9/9/99-9/10/99			
Location:	Site H, DW#1	m³/min	lpm	total m <sup>3</sup>
Sampler flow rate (m <sup>3</sup> ,	/min) = 1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)	0.227	227	338
m = sample	er slope	33.3		
b = sample	r intercept	-0.88		
magn = ave	erage magnehelic gage reading (inch H2O)	59		
average ter	mperature during run (°F)	71		
Tav = avera	age temperature (°K)	344		
average ba	rometric pressure during run (in Hg)	29.94		
Pav = avera	age pressure (mmHg)	760		
run start tim	ne	1856		
run end tim	e	1948		
total run tim	ne (minutes)	1492		

Site Information		PUF	
Location: Sauget, IL		PUF Model No.:	TE-1000PUF
Date: 9/8/99		Blower Model No.:	TE-1004
Operator: JWP		Magnehelic Serial No.:	R990610
Temperature (°F):	<b>7</b> 8	Sampler No.:	17
Temperature (°C):	26		
Temperature (K):	299		
Elevation (ft):	568 (Lambert airport)	Calibration O	rifice
BP (in Hg):	29.9	Model No.:	TE-5040A
Pa (BP mm Hg):	759	Serial No.:	0098
		Calibration Date:	8/10/99
		Qstd Slope (m):	9.57809
		Qstd Intercept (b):	-0.030300

### Pre-calibration

		oler	Samp			
				e	Orific	
		Mang Flow	Magn Flow	Qstd	Flow	
	Linear Regression	(corrected)	("H2O)	(m3/min)	("H2O)	Run No.
		8.36	70	0.272	6.65	1
30.8	slope	7.74	60	0.252	5.70	2
-0.07	intercept	7.06	50	0.234	4.90	3
0.9984	coor. Coeff	6.32	40	0.209	3.90	4
		5.47	30	0.178	2.80	5
	<del></del>	34.94	sum(y)	1.145	sum(x)	
		249	sum(y) sq	0.268	sum(x) sq.	S
		8.17	sum comb			
		5	n			
		6.99	sum(y)/n	0.229	sum(x)/n	
		1221	sum(y)^2	1.31	sum(x)^2	

#### Post-calibraiton

 Temperature (°F):
 80

 Temperature (°C):
 27

 Temperature (K):
 300

 BP (in Hg):
 29.87

 Pa (BP mm Hg):
 759

				Sample	er .	
	Orific	e				
	Flow	Qstd:	%	Magn Flow	Mang Flow	%
Run No.	("H2O)	(m3/min)	difference	("H2O)	(corrected)	difference
2	6.10	0.260	3.1	60	7.72	-0.2

Sampling date:	9/9/99-9/10/99	•		
Location:	Site H, UP#1	m³/min	lpm	total m 3
Sampler flow rate (m 3/	(min) = 1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)	0.219	219	324
m = sample	r slope	30.8		
b = sampler	intercept	-0.07		
magn ≈ ave	rage magnehelic gage reading (inch H2O)	59		
average ten	nperature during run (°F)	71		
Tav = avera	ge temperature (°K)	344		
average bar	rometric pressure during run (in Hg)	29.94		
Pav = avera	ige pressure (mmHg)	760		
run start tim	e	1930		
run end time		2013		
total run time	e (minutes)	1483		

Site Information

Sauget, IL

PUF Model No.:

Magnehelic Serial No.:

TE-1000PUF

Location: Date:

9/8/99 **JWP** 

Blower Model No.:

TE-1004

Operator:

78

Temperature (°F): Temperature (°C):

26

R990015ML17

Temperature (K):

299

**Calibration Orifice** 

**PUF** 

Elevation (ft):

568 (Lambert airport) 29.9

Model No.:

Sampler No.:

TE-5040A

BP (in Hg): Pa (BP mm Hg): 759

Serial No.:

0098

Calibration Date:

8/10/99

Qstd Slope (m):

9.57809

Qstd Intercept (b):

-0.030300

#### Pre-calibration

		oler	Samp			
				е	Orific	
		Mang Flow	Magn Flow	Qstd	Flow	
	Linear Regression	(corrected)	("H2O)	(m3/min)	("H2O)	Run No.
		8.36	70	0.272	6.65	1
30.	slope	7.74	60	0.259	6.00	2
-0.1	intercept	7.06	50	0.236	5.00	3
0.997	coor. Coeff	6.32	40	0.209	3.90	4
		5.47	30	0.181	2.90	5
		34.94	sum(y)	1.157	sum(x)	
		249	sum(y) sq	0.273	sum(x) sq.	5
		8.25	sum comb			
		5	n			
	•	6.99	sum(y)/n	0.231	sum(x)/n	
		1221	sum(y)^2	1.34	sum(x)^2	

#### Post-calibraiton

Temperature (°F): 75 24 Temperature (°C): Temperature (K): 297 BP (in Hg): 30.01 Pa (BP mm Hg): 762

	···			Sample	er	
	Orific	:e	ľ	•		
	Flow	Qstd	%	Magn Flow	Mang Flow	%
Run No.	("H2O)	(m3/min)	difference	("H2O)	(corrected)	difference
2	5.85	0.257	-0.8	60	7.77	0.5

Sampling date:	9/10/99-9/11/99			
Location:	Site G, DW#2	m³/min	lpm	total m ³
Sampler flow rate (m <sup>3</sup> )	/min) = 1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)	0.212	212	305
m = sample	er slope	30.7		
b = sample	r intercept	-0.11		
magn = ave	erage magnehelic gage reading (inch H2O)	56		
average ter	mperature during run (°F)	77		
Tav = avera	age temperature (°K)	350		
average ba	rometric pressure during run (in Hg)	29.94		
Pav = avera	age pressure (mmHg)	761		
run start tim	ne	955		
run end tim	e	955		
total run tim	ne (minutes)	1440		

Site Information		PUF	
Location: Sauget, IL		PUF Model No.:	TE-1000PUF
Date: 9/8/99		Blower Model No.:	TE-1004
Operator: JWP		Magnehelic Serial No.:	
Temperature (°F):	78	Sampler No.:	19
Temperature (°C):	26		
Temperature (K):	299		
Elevation (ft):	568 (Lambert airport)	Calibration Orifi	ce
BP (in Hg):	29.9	Model No.:	TE-5040A
Pa (BP mm Hg):	759	Serial No.:	0100
		Calibration Date:	8/10/99
		Qstd Slope (m):	9.55896
		Qstd Intercept (b):	-0.054620

## Pre-calibration

		oler	Samp			•
			-	e	Orific	
		Mang Flow	Magn Flow	Qstd	Flow	
	Linear Regression	(corrected)	("H2O)	(m3/min)	("H2O)	Run No.
		8.36	70	0.272	6.50	1
31	slope	7.74	60	0.254	5.65	2
-0.3	intercept	7.06	50	0.231	4.65	3
0.999	coor. Coeff	6.32	40	0.208	3.75	4
		5.47	30	0.182	2.85	5
-		34.94	sum(y)	1.147	sum(x)	
		249	sum(y) sq	0.268	sum(x) sq.	S
		8.18	sum comb			
		5	n			
		6.99	sum(y)/n	0.229	sum(x)/n	
		1221	sum(y)^2	1.32	$sum(x)^2$	

## Post-calibration

Temperature (°F):	75
Temperature (°C):	24
Temperature (K):	297
BP (in Hg):	30.01
Pa (BP mm Hg):	762

				Sample	er	
	Orific	:е		•		
	Flow	Qstd	%	Magn Flow	Mang Flow	%
Run No.	("H2O)	(m3/min)	difference	("H2O)	(corrected)	difference
2	5.45	0.251	-1.3	60	7.77	0.5

Sampling date:	9/10/99-9/11/99			
Location:	Site G, DW#2	m³/min	lpm	total m <sup>3</sup>
Sampler flow rate $(m^3/min) = 1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)$		0.202	202	291
m ≃ san	npler slope	31.8		
b = sam	pler intercept	-0.31		
magn =	average magnehelic gage reading (inch H2O)	51		
average	temperature during run (°F)	77		
Tav = a	verage temperature (°K)	350		
average	barometric pressure during run (in Hg)	29.94		
Pav = a	verage pressure (mmHg)	761		
run star	time	956		
run end	time	956		
total run	time (minutes)	1440		

2 of 2

78

26

568 (Lambert airport)

299

29.9

759

75

24

297

V 170	INTO	mation
2116	1111111	mauvn

Sauget, IL 9/8/99

**JWP** 

Temperature (°F): Temperature (°C):

Temperature (K):

BP (in Hg):

Elevation (ft):

Location:

Operator:

Date:

Pa (BP mm Hg):

PUF Model No.: Blower Model No.:

TE-1000PUF TE-1004

PUF

Magnehelic Serial No.:

R990610ML70

Sampler No.:

20

**Calibration Orifice** 

Model No.:

TE-5040A 0100

Serial No.: Calibration Date:

8/10/99

Qstd Slope (m):

9.55896

Qstd Intercept (b):

-0.054620

#### Pre-calibration

			Sam	pler		<del>_</del> .
	Orific	e				
	Flow	Qstd	Magn Flow	Mang Flow		
Run No.	("H2O)	(m3/min)	("H2O)	(corrected)	Linear Regressio	n
1	6.40	0.270	70	8.36		500
2	5.80	0.257	60	7.74	slope	31.1
3	4.90	0.237	50	7.06	intercept	-0.18
4	3.75	0.208	40	6.32	coor. Coeff	0.9957
5	2.80	0.181	30	5.47		
	sum(x)	1.153	sum(y)	34.94		
;	sum(x) sq.	0.271	sum(y) sq	249		
			sum comb	8.22		
			n	5		
	sum(x)/n	0.231	sum(y)/n	6.99		
	sum(x)^2	1.33	sum(y)^2	1221		

#### Post-calibraiton

Temperature (°F): Temperature (°C):

Temperature (K): BP (in Ha): Pa

(in Hg):	30.01
(BP mm Hg):	762

				Sample	er	
	Orific	ce				
	Flow	Qstd	%	Magn Flow	Mang Flow	%
Run No.	("H2O)	(m3/min)	difference	("H2O)	(corrected)	difference
2	5.65	0.255	-0.8	60	7.77	0.5

Sampling date:	9/10/99-9/11/99			
Location:	Site L, DW#1	m³/min	lpm	total m <sup>3</sup>
Sampler flow ra	ate (m³/min) = 1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)	0.216	216	312
m =	sampler slope	31.1		
b =	sampler intercept	-0.18		
mag	gn = average magnehelic gage reading (inch H2O)	59		
ave	erage temperature during run (°F)	77		
Tav	v = average temperature (°K)	350		
ave	erage barometric pressure during run (in Hg)	29.94		
Pav	v = average pressure (mmHg)	760		
run	start time	1022		
run	end time	1022		
tota	al run time (minutes)	1440		

Site Information	Site Information P		
Location: Sauget, IL		PUF Model No.:	TE-1000PUF
Date: 9/8/99		Blower Model No.:	TE-1004
Operator: JWP		Magnehelic Serial No.:	R990616ML12
Temperature (°F):	<b>78</b> :	Sampler No.:	21
Temperature (°C):	26		
Temperature (K):	299		
Elevation (ft):	568 (Lambert airport)	Calibration C	)rifice
BP (in Hg):	29.9	Model No.:	TE-5040A
Pa (BP mm Hg):	759	Serial No.:	0098
		Calibration Date:	8/10/99
		Qstd Slope (m):	9.57809
		Qstd Intercept (b):	-0.030300

#### Pre-calibration

		oler	Samp			
			_	9	Orific	
		Mang Flow	Magn Flow	Qstd	Flow	
1	Linear Regression	(corrected)	("H2O)	(m3/min)	("H2O)	Run No.
		8.36	70	0.276	6.85	1
2	slope	7.74	60	0.259	6.00	2
(	intercept	7.06	50	0.237	5.05	3
0.9	coor. Coeff	6.32	40	0.210	3.95	4
		5.47	30	0.179	2.85	5
		34.94	sum(y)	1.162	sum(x)	
		249	sum(y) sq	0.276	sum(x) sq.	5
		8.29	sum comb			
		5	n			
		6.99	sum(y)/n	0.232	sum(x)/n	
		1221	sum(y)^2	1.35	sum(x)^2	

#### Post-calibraiton

 Temperature (°F):
 82

 Temperature (°C):
 28

 Temperature (K):
 301

 BP (in Hg):
 30.01

 Pa (BP mm Hg):
 762

				Sampler			
	Orific	:e		_			
	Flow	Qstd <sup>1</sup>	%	Magn Flow	Mang Flow	%	
Run No.	("H2O)	(m3/min)	difference	("H2O)	(corrected)	difference	
2	5.80	0.254	-1.9	60	7.72	-0.2	

Sampling date:	9/10/99-9/11/99			
Location:	Site G, UP#2	m³/min	lpm	total m <sup>3</sup>
Sampler flow rate	$(m^3/min) = 1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)$	0.208	208	300
m = sa	ampler slope	29.5		
b = sa	mpler intercept	0.13		
magn = average magnehelic gage reading (inch H2O)		55		
average temperature during run (°F)		80		
Tav =	average temperature (°K)	353		
averag	ge barometric pressure during run (in Hg)	29.94		
Pav =	average pressure (mmHg)	760		
run sta	art time	1105		
run en	d time	1105		
total ru	in time (minutes)	1440		

Site Information		PUF		
Location: Sauget, IL		PUF Model No.:	TE-1000PUF	
Date: 9/8/99	!	Blower Model No.:	TE-1004	
Operator: JDB	İ	Magnehelic Serial No.:	R9906757R44	
Temperature (°F):	78	Sampler No.:	22	
Temperature (°C):	26			
Temperature (K):	299			
Elevation (ft):	568 (Lambert airport)	Calibration Orifice		
BP (in Hg):	29.9	Model No.:	TE-5040A	
Pa (BP mm Hg):	759	Serial No.:	0101	
		Calibration Date:	8/10/99	
		Qstd Slope (m):	9.47526	
		Qstd Intercept (b):	-0.044390	

### Pre-calibration

	4	Samı	oler		
	Orifice				
Flov	Flow Qstd	Magn Flow	Mang Flow		
("H2C	"H2O) (m3/min)	("H2O)	(corrected)	Linear Regression	n
6.4	6.40 0.271	70	8.36		
5.7	5.70 0.256	60	7.74	slope	32.7
4.9	4.90 0.238	50	7.06	intercept	-0.62
3.9	3.90 0.213	40	6.32	coor. Coeff	0.9974
2.9	2.90 0.184	30	5.47		
sum(x,	<i>um(x)</i> 1.163	sum(y)	34.94		
sum(x) sq	(x) sq. 0.275	sum(y) sq	249		
		sum comb	8.28		
		n	5		
sum(x)/r	n(x)/n 0.233	sum(y)/n	6.99		
sum(x)^2	$n(x)^2$ 1.35	sum(y)^2	1221		

### Post-calibraiton

 Temperature (°F):
 82

 Temperature (°C):
 28

 Temperature (K):
 301

 BP (in Hg):
 30.01

 Pa (BP mm Hg):
 762

				Sampler			
	Orific	ce c					
	Flow	Qstd	%	Magn Flow	Mang Flow	%	
Run No.	("H2O)	(m3/min)	difference	("H2O)	(corrected)	difference	
2	5.45	0.250	-2.4	60	7.72	-0.2	

total run time (minutes)

Sampling date:	9/10/99-9/11/99			
Location:	Site G, UP#1	m³/min	lpm	total m <sup>3</sup>
Sampler flow rate (m	<sup>3</sup> /min) = 1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)	0.218	218	315
m = samp	ler slope	32.7		
b = sampler intercept		-0.62		
magn = average magnehelic gage reading (inch H2O)		60		
average to	emperature during run (°F)	80		
Tav = ave	rage temperature (°K)	353		
average b	arometric pressure during run (in Hg)	29.94		
Pav = ave	rage pressure (mmHg)	760		
run start ti	me	1128		
run end tir	me	1128		

1440

Site Information

PUF Model No.:

TE-1000PUF

Location: Date:

Sauget, IL 9/8/99

Blower Model No.:

TE-1004

Operator:

**JDB** 

Magnehelic Serial No.:

Temperature (°F):

78

R9906116ML2

Temperature (°C):

26

23

Sampler No.:

**PUF** 

Temperature (K):

299

**Calibration Orifice** 

Elevation (ft):

568 (Lambert airport) 29.9 759

Model No.:

TE-5040A

BP (in Hg): Pa (BP mm Hg):

Serial No.:

0101

Calibration Date:

8/10/99

Qstd Slope (m):

9.47526

Qstd Intercept (b):

-0.044390

			Sam	pler		
	Orific	e l				
	Flow	Qstd	Magn Flow	Mang Flow		
Run No.	("H2O)	(m3/min)	("H2O)	(corrected)	Linear Regression	n
1	6.13	0.266	70	8.36		
2	5.50	0.252	60	7.74	slope	32.2
3	4.65	0.232	50	7.06	intercept	-0.30
4	3.65	0.206	40	6.32	coor. Coeff	0.9972
5	2.70	0.178	30	5.47		
· · · · · · · · · · · · · · · · · · ·	sum(x)	1.133	sum(y)	34.94		
	sum(x) sq.	0.262	sum(y) sq	249		
			sum comb	8.08		
			n	5		
	sum(x)/n	0.227	sum(y)/n	6.99		

1221

#### Post-calibraiton

 $sum(x)^2$ 

Temperature (°F): Temperature (°C): 84 29

1.28

Temperature (K):

302 29.99

BP (in Hg): Pa (BP mm Hg):

762

	Sampler			,		
		•		•	Orific	
%	Mang Flow	Magn Flow	%	Qstd	Flow	
difference	(corrected)	("H2O)	difference	(m3/min)	("H2O)	Run No.
-0.4	7.70	60	-6.2	0.237	4.90	2

sum(y)^2

Sampling date:	9/10/99-9/11/99			
Location:	Site L, UP#1	m³/min	lpm	total m <sup>3</sup>
Sampler flow rate (m	<sup>3</sup> /min) = 1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)	0.207	207	298
m = samp	oler slope	32.2		
b = samp	ler intercept	-0.30		
magn = a	verage magnehelic gage reading (inch H2O)	57		
average temperature during run (°F)		81		
Tav = ave	erage temperature (°K)	354		
average barometric pressure during run (in Hg)		29.93		
Pav = ave	erage pressure (mmHg)	760		
run start t	ime	1230		
run end ti	me	1230		
total run t	ime (minutes)	1440		

Site Information		PUF		
Location: Sauget, IL		PUF Model No.:	TE-1000PUF	
Date: 9/8/99		Blower Model No.:	TE-1004	
Operator: JDB		Magnehelic Serial No.:	R990616ML11	
Temperature (°F):	78	Sampler No.:	24	
Temperature (°C):	26			
Temperature (K):	299			
Elevation (ft):	568 (Lambert airport)	Calibration Orifice		
BP (in Hg):	29.9	Model No.:	TE-5040A	
Pa (BP mm Hg):	759	Serial No.:	0101	
		Calibration Date:	8/10/99	
		Qstd Slope (m):	9.47526	

Qstd Intercept (b):

Pre-ca	libratior	1
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		oler	Samp	1		
			-	9	Orifice	
		Mang Flow	Magn Flow	Qstd	Flow	
	Linear Regression	(corrected)	("H2O)	(m3/min)	("H2O)	Run No.
		8.36	70	0.275	6.60	1
32.0	slope	7.74	60	0.257	5.75	2
-0.53	intercept	7.06	50	0.239	4.95	3
0.9963	coor. Coeff	6.32	40	0.218	4.10	4
		5.47	30	0.184	2.90	5
		34.94	sum(y)	1.174	sum(x)	
		249	sum(y) sq	0.281	sum(x) sq.	S
		8.37	sum comb			
		5	n			
		6.99	sum(y)/n	0.235	sum(x)/n	
		1221	sum(y)^2	1.38	sum(x)^2	

#### Post-calibraiton

 Temperature (°F):
 84

 Temperature (°C):
 29

 Temperature (K):
 302

 BP (in Hg):
 29.99

 Pa (BP mm Hg):
 762

				Sample	er	
	Orific	e				
	Flow	Qstd	%	Magn Flow	Mang Flow	%
Run No.	("H2O)	(m3/min)	difference	("H2O)	(corrected)	difference
2	5.50	0.251	-2.6	60	7.70	-0.4

-0.044390

Sampling da	ite: 9/10/99-9/11/99	•		
Location:	Site L, UP#1	m³/min	lpm	total m <sup>3</sup>
Sampler flow	v rate (m <sup>3</sup> /min) = 1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)	0.211	211	304
r	n = sampler slope	32.0		
t	e sampler intercept	-0.53		
r	nagn = average magnehelic gage reading (inch H2O)	55		
a	everage temperature during run (°F)	81		
7	av = average temperature (°K)	354		
а	verage barometric pressure during run (in Hg)	29.93		
F	Pav = average pressure (mmHg)	760		
r	un start time	1231		
r	un end time	1231		
to	otal run time (minutes)	1440		

26 299

759

568 (Lambert airport)

011 1 4 41	
Site Information	

Location: Sauget, IL 9/8/99 Date: Operator:

**JDB** 78 Temperature (°F):

Temperature (°C): Temperature (K): Elevation (ft):

29.9 BP (in Hg): Pa (BP mm Hg):

**PUF** PUF Model No.:

Blower Model No.: Magnehelic Serial No.: TE-1000PUF TE-1004

8990610TR5

25

**Calibration Orifice** 

Model No.: Serial No.:

Sampler No.:

TE-5040A 0101

Calibration Date: Qstd Slope (m):

8/10/99 9.47526

Qstd Intercept (b):

-0.044390

Pro-calibration

		oler	Sam			
				e	Orific	
		Mang Flow	Magn Flow	Qstd	Flow	
ın	Linear Regression	(corrected)	("H2O)	(m3/min)	("H2O)	Run No.
		8.36	70	0.278	6.70	1
30.6	slope	7.74	60	0.261	5.90	2
-0.22	intercept	7.06	50	0.242	5.05	3
0.9979	coor. Coeff	6.32	40	0.213	3.90	4
		5.47	30	0.185	2.92	5
		34.94	sum(y)	1.177	sum(x)	
		249	sum(y) sq	0.283	sum(x) sq.	s
		8.40	sum comb			
	•	5	n			
		6.99	sum(y)/n	0.235	sum(x)/n	
		1221	sum(y)^2	1.39	sum(x)^2	

### Post-calibraiton

Temperature (°F): 84 Temperature (°C): 29 302 Temperature (K): BP (in Hg): 29.99 Pa (BP mm Hg): 762

				Sample	er	
	Orific	:е				
	Flow	Qstd	%	Magn Flow	Mang Flow	%
Run No.	("H2O)	(m3/min)	difference	("H2O)	(corrected)	difference
2	5.50	0.251	-3.9	60	7.70	-0.4

Sampling date:	910/99-9/11/99			
Location:	Site L, UP#1	m³/min	lpm	total m ³
Sampler flow rate $(m^3/min) = 1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)$		0.220	220	317
m = s	sampler slope	30.6		
b = s	ampler intercept	-0.22		
magr	= average magnehelic gage reading (inch H2O)	60		
avera	ge temperature during run (°F)	81		
Tav =	average temperature (°K)	354		
avera	ge barometric pressure during run (in Hg)	29.93		
Pav =	average pressure (mmHg)	760		
run si	tart time	1229		
run e	nd time	1229		
total	run time (minutes)	1440		

Site Information	1 1	PUF	
Location: Sauget, IL		PUF Model No.:	TE-1000PUF
Date: 9/8/99		Blower Model No.:	TE-1004
Operator: JDB		Magnehelic Serial No.:	R990114ML52
Temperature (°F):	78	Sampler No.:	26
Temperature (°C):	26		
Temperature (K):	29\$		
Elevation (ft):	568 (Lambert airport)	Calibration O	rifice
BP (in Hg):	29.9	Model No.:	TE-5040A
Pa (BP mm Hg):	759	Serial No.:	0101
		Calibration Date:	8/10/99
		Qstd Slope (m):	9.47526
		Ostd Intercept (b):	-0.044390

			Sam	pler		
	Orific	e				
	Flow	Qstd	Magn Flow	Mang Flow		
Run No.	("H2O)	(m3/min)	("H2O)	(corrected)	Linear Regressio	n
1	6.80	0.280	70	8.36		
2	6.05	0.264	60	7.74	slope	31.4
3	5.10	0.243	50	7.06	intercept	-0.51
4	4.10	0.218	40	6.32	coor. Coeff	0.9985
5	3.05	0.189	30	5.47		
	sum(x)	1.193	sum(y)	34.94		
	sum(x) sq.	0.290	sum(y) sq	249		
			sum comb	8.50		
			n	5		
	sum(x)/n	0.239	sum(y)/n	6.99		
	$sum(x)^2$	1.42	sum(y)^2	1221		

### Post-calibraiton

 Temperature (°F):
 82

 Temperature (°C):
 28

 Temperature (K):
 301

 BP (in Hg):
 30.01

 Pa (BP mm Hg):
 762

<u> </u>				Sample	er	
	Orific	:e				
	Flow	Qstd	%	Magn Flow	Mang Flow	%
Run No.	("H2O)	(m3/min)	difference	("H2O)	(corrected)	difference
2	5.60	0.254	-4.1	60	7.72	-0.2

Sampling date:	9/10/99-9/11/99			
Location:	Site G, UP#1	m³/min	lpm	total m 3
Sampler flow rate (n	m <sup>3</sup> /min) = 1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)	0.210	210	302
m = sam	pler slope	31.4		
b = sam	pler intercept	-0.51		
magn =	average magnehelic gage reading (inch H2O)	51		
average	temperature during run (°F)	79		
Tav = av	rerage temperature (°K)	352		
average	barometric pressure during run (in Hg)	29.94		
Pav = av	rerage pressure (mmHg)	760		
run start	time	1126		
run end	time	1126		
total run	time (minutes)	1440		

Site Information

Sauget, IL

PUF Model No.:

TE-1000PUF

Location: Date:

9/8/99

**PUF** 

TE-1004

Operator:

**JDB** 

Blower Model No.: Magnehelic Serial No.:

R980401LF6

Temperature (°F):

78 26

27

Temperature (°C): Temperature (K):

Sampler No.:

299 568 (Lambert airport)

Calibration Orifice

Elevation (ft):

29.9

Model No.:

TE-5040A

BP (in Hg): Pa (BP mm Hg):

759

Serial No.:

0101

Calibration Date:

8/10/99

Qstd Slope (m):

9.47526

Qstd Intercept (b):

-0.044390

Pre-calibration

			Sam	pler		
	Orific	e				
	Flow	Qstd	Magn Flow	Mang Flow		
Run No.	("H2O)	(m3/min)	("H2O)	(corrected)	Linear Regression	n
1	6.40	0.271	70	8.36		
2	5.90	0.261	60	7.74	slope	30.6
3	4.70	0.233	50	7.06	intercept	-0.08
4	3.90	0.213	40	6.32	coor. Coeff	0.9943
_ 5	2.75	0.179	30	5.47		
	sum(x)	1.158	sum(y)	34.94		
5	sum(x) sq.	0.273	sum(y) sq	249		
			sum comb	8.26		
			п	5		
	sum(x)/n	0.232	sum(y)/n	6.99		
	sum(x)^2	1.34	$sum(y)^2$	1221		

#### Post-calibraiton

Temperature (°F): 82 Temperature (°C): 28 Temperature (K): 301 BP (in Hg): 30.01 Pa (BP mm Hg): 762

				Sampler				
	Orifice			•				
	Flow	Qstd	%	Magn Flow	Mang Flow	%		
Run No.	("H2O)	(m3/min)	difference	("H2O)	(corrected)	difference		
2	5.30	0.247	-5.6	60	7.72	-0.2		

Sampling date:	9/10/99-9/11/99			
Location:	Site G, UP#2	m³/min	lpm	total m <sup>3</sup>
Sampler flow rate (m	Sampler flow rate $(m^3/min) = 1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)$		202	291
m = samp	pler slope	30.6		
b = samp	eler intercept	-0.08		
magn = a	verage magnehelic gage reading (inch H2O)	52		
average t	temperature during run (°F)	80		
Tav = ave	erage temperature (°K)	353		
average l	barometric pressure during run (in Hg)	29.94		
Pav = ave	erage pressure (mmHg)	760		
run start (	time	1104		
run end ti	ime	1104		
total run t	time (minutes)	1440		

Site Ir	ıform	ation
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9/8/99

**JDB** 

Temperature (°F): Temperature (°C):

Location:

Operator:

Date:

Temperature (K): Elevation (ft):

BP (in Hg): Pa (BP mm Hg):

Sauget, IL

78

26 299 568 (Lambert airport)

29.9 759 PUF

PUF Model No.: Blower Model No.:

TE-1000PUF TE-1004

Magnehelic Serial No.:

R98072110L42

Sampler No.:

**Calibration Orifice** 

Model No.. Serial No.:

TE-5040A 0101

Calibration Date:

8/10/99

Qstd Slope (m):

9.47526

Qstd Intercept (b):

-0.044390

		oler	Samp			
			•	•	Orifice	
	Linear Regression	Mang Flow (corrected)	Magn Flow ("H2O)	Qstd (m3/min)	Flow ("H2O)	Run No.
		8.36	70	0.276	6.65	1
30.5	slope	7.74	60	0.260	5.85	2
-0.15	intercept	7.06	50	0.238	4.90	3
0.9989	coor. Coeff	6.32	40	0.213	3.90	4
		5.47	30	0.183	2.85	5
		34.94	sum(y)	1.170	sum(x)	
		249	sum(y) sq	0.279	sum(x) sq.	S
		8.34	sum comb			
		5	n			
		6.99	sum(y)/n	0.234	sum(x)/n	

1221

#### Post-calibraiton

Temperature (°F): 82 Temperature (°C): 28 Temperature (K): 301 BP (in Hg): 30.01 Pa (BP mm Hg): 762

 $sum(x)^2$ 

		<del></del>		Sample	er	
	Orific	e				
	Flow	Qstd	%	Magn Flow	Mang Flow	%
Run No.	("H2O)	(m3/min)	difference	("H2O)	(corrected)	difference
2	5.50	0.251	-3.3	60	7.72	-0.2

 $sum(y)^2$ 

1.37

Sampling date:	9/10/99-9/11/99			
Location:	Site G, UP#1	m³/min	lpm	total m <sup>3</sup>
Sampler flow rate $(m^3/min) = 1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)$		0.214	214	308
m = :	sampler slope	30.5		
b = s	ampler intercept	-0.15		
magr	n = average magnehelic gage reading (inch H2O)	57		
avera	age temperature during run (°F)	79		
Tav =	average temperature (°K)	352		
avera	age barometric pressure during run (in Hg)	29.94		
Pav :	average pressure (mmHg)	760		
run s	tart time	1127		
run e	nd time	1127		
total	run time (minutes)	1440		

Sita	Information	
SHE	miormanon	

PUF

Location: Sauget, IL 9/8/99 Date: AJC

PUF Model No.: Blower Model No.:

Sampler No.:

TE-1000PUF TE-1004

Operator:

78

Magnehelic Serial No.:

R990615TR47 29

Temperature (°F): Temperature (°C):

26 299

Temperature (K): Elevation (ft):

568 (Lambert airport)

**Calibration Orifice** 

TE-5040A

BP (in Hg): Pa (BP mm Hg): 29.9 759 Model No.: Serial No.:

0099

Calibration Date: Qstd Slope (m):

8/10/99

9.71704

Qstd Intercept (b):

-0.032420

#### Pre-calibration

		oler	Samp			
	•		-	e	Orific	
		Mang Flow	Magn Flow	Qstd	Flow	
	Linear Regression	(corrected)	("H2O)	(m3/min)	("H2O)	Run No.
		8.36	70	0.275	7.00	1
30.	slope	7.74	60	0.258	6.15	2
-0.1	intercept	7.06	50	0.237	5.15	3
0.999	coor. Coeff	6.32	40	0.211	4.10	4
		5.47	30	0.181	3.00	5
		34.94	sum(y)	1.163	sum(x)	
		249	sum(y) sq	0.276	sum(x) sq.	5
		8.30	sum comb			
		5	n			
		6.99	sum(y)/n	0.233	sum(x)/n	
		1221	$sum(y)^2$	1.35	sum(x)^2	

#### Post-calibraiton

Temperature (°F): 75 Temperature (°C): 24 297 Temperature (K): BP (in Hg): 30.01 Pa (BP mm Hg): 762

				Sample	er	
	Orific	e	ļ			
	Flow	Qstd	%	Magn Flow	Mang Flow	%
Run No.	("H2O)	(m3/min)	difference	("H2O)	(corrected)	difference
2	5.80	0.252	-2.5	60	7.77	0.5

Sampling date:	9/10/99-9/11/99			
Location:	Site L, DW#2	m³/min	lpm	total m 3
Sampler flow rate $(m^3/min) = 1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)$		0.215	215	309
m = sample	r slope	30.5		
b = sample	rintercept	-0.11		
magn = ave	rage magnehelic gage reading (inch H2O)	57		
average ter	nperature during run (°F)	78		
Tav = avera	nge temperature (°K)	351		
average ba	rometric pressure during run (in Hg)	29.94		
Pav = avera	age pressure (mmHg)	760		
run start tim	e	1033		
run end time	9	1033		
total run tim	e (minutes)	1440		

Site Information
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Site Information		PUF	
Location: Sauget, IL		PUF Model No.:	TE-1000PUF
Date: 9/8/99		Blower Model No.:	TE-1004
Operator: JDB		Magnehelic Serial No.:	R990615TR36
Temperature (°F):	78	Sampler No.:	30
Temperature (°C):	26		
Temperature (K):	299		
Elevation (ft):	568 (Lambert airport)	Calibration O	rifice
BP (in Hg):	29.9	Model No.:	TE-5040A
Pa (BP mm Hg):	759	Serial No.:	0101
		Calibration Date:	8/10/99

Qstd Slope (m): Qstd Intercept (b):

9.47526 -0.044390

Pre-calibration

			Sam	pler		
	Orific	e l				
Run No.	Flow ("H2O)	Qstd (m3/min)	Magn Flow ("H2O)	Mang Flow (corrected)	Linear Regression	n
1	6.40	0.271	70	8.36		
2	5.80	0.259	60	7.74	slope	31.3
3	4.80	0.236	50	7.06	intercept	-0.25
4	3.85	0.211	40	6.32	coor. Coeff	0.9968
5	2.80	0.181	30	5.47		
	sum(x)	1.158	sum(y)	34.94		
;	sum(x) sq.	0.273	sum(y) sq	249		
			sum comb	8.26		
			n	5		
	sum(x)/n	0.232	sum(y)/n	6.99		
	$sum(x)^2$	1.34	sum(y)^2	1221		

#### Post-calibraiton

Temperature (°F): 75 24 Temperature (°C): Temperature (K): 297 BP (in Hg): 30.01 Pa (BP mm Hg): 762

				Sample	er	
	Orific	e	<b>!</b>			
	Flow	Qstd	%	Magn Flow	Mang Flow	%
Run No.	("H2O)	(m3/min)	difference	(*H2O)	(corrected)	difference
2	5.30	0.248	-4.0	60	7.77	0.5

Sampling date:	9/10/99-9/11/99			
Location:	Site L, DW#2	m³/min	lpm	total m <sup>3</sup>
Sampler flow rate (m <sup>3</sup>	/min) = 1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)	0.205	205	296
m = samp	er slope	31.3		
b = sample	er intercept	-0.25		
magn = av	verage magnehelic gage reading (inch H2O)	53		
average te	emperature during run (°F)	78		
Tav = ave	rage temperature (°K)	351		
average b	arometric pressure during run (in Hg)	29.94		
Pav = ave	rage pressure (mmHg)	760		
run start ti	me	1034		
run end tin	ne	1034		
total run tir	me (minutes)	1440		

	Site Information		PUF	
Location:	Sauget, IL		PUF Model No.:	TE-1000PUF
Date:	9/8/99		Blower Model No.:	TE-1004
Operator:	JDB		Magnehelic Serial No.:	R990616ML1
Temperatur	re (°F):	78	Sampler No.:	31
Temperatur	re (°C):	26		
Temperatur	re (K):	299		
Elevation (f	t):	568 (Lambert airport)	Calibration Orifi	ce
BP (in Hg):		29.9	Model No.:	TE-5040A
Pa (BP mm	Hg):	759	Serial No.:	0099
			Calibration Date:	8/10/99

Qstd Slope (m):

Qstd Intercept (b):

Pre-calibration

			Sam	pler		
	Orific	ce				
	Flow	Qstd	Magn Flow	Mang Flow		
Run No.	("H2O)	(m3/min)	("H2O)	(corrected)	Linear Regression	
1	7.00	0.275	70	8.36		
2	6.20	0.259	60	7.74	slope	30.3
3	5.00	0.233	50	7.06	intercept	-0.03
4	4.05	0.210	40	6.32	coor. Coeff	0.9989
5	3.00	0.181	30	5.47		
	sum(x)	1.159	sum(y)	34.94		
	sum(x) sq.	0.274	sum(y) sq	249		
			sum comb	8.27		
			n	5		
	sum(x)/n	0.232	sum(y)/n	6.99		
	sum(x)^2	1.34	$sum(y)^2$	1221		

#### Post-calibraiton

 Temperature (°F):
 75

 Temperature (°C):
 24

 Temperature (K):
 297

 BP (in Hg):
 30.01

 Pa (BP mm Hg):
 762

	er	Sample				
		-		•	Orific	
%	Mang Flow	Magn Flow	%	Qstd	Flow	
difference	(corrected)	("H2O)	difference	(m3/min)	("H2O)	Run No.
0.5	7.77	60	-2.0	0.254	5.90	2

9.71704

-0.032420

Sampling date:	9/10/99-9/11/99	•		
Location:	Site G, DW#2	m³/min	lpm	total m <sup>3</sup>
Sampler flow rate (	m <sup>3</sup> /min) = 1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)	0.216	216	311
m = san	npler slope	30.3		
b = sam	pler intercept	-0.03		
magn =	average magnehelic gage reading (inch H2O)	58		
average	e temperature during run (°F)	77		
Tav = a	verage temperature (°K)	350		
average	barometric pressure during run (in Hg)	29.94		
Pav = a	verage pressure (mmHg)	761		
run star	t time	957		
run end	time	957		
total run	time (minutes)	1440		

Site Information		PUF	
Location: Sauget, IL		PUF Model No.:	TE-1000PUF
Date: 9/8/99		Blower Model No.:	TE-1004
Operator: JDB		Magnehelic Serial No.:	R990115524
Temperature (°F):	78	Sampler No.:	32
Temperature (°C):	26		
Temperature (K):	299		
Elevation (ft):	568 (Lambert airport)	Calibration Orifi	ce
BP (in Hg):	29.9	Model No.:	TE-5040A
Pa (BP mm Hg):	759	Serial No.:	0101
		Calibration Date:	8/10/99
		Qstd Slope (m):	9.47526
		Qstd Intercept (b):	-0.044390

Pre-calibration

		oler	Samp			
				e	Orific	
		Mang Flow	Magn Flow	Qstd	Flow	
	Linear Regression	(corrected)	("H2O)	(m3/min)	("H2O)	Run No.
		8.36	70	0.275	6.60	1
31.0	slope	7.74	60	0.263	6.00	2
-0.3	intercept	7.06	50	0.245	5.20	3
0.990	coor. Coeff	6.32	40	0.219	4.15	4
		5.47	30	0.184	2.90	5
		34.94	sum(y)	1.187	sum(x)	
		249	sum(y) sq	0.287	sum(x) sq.	S
		8.46	sum comb			
		5	n			
	•	6.99	sum(y)/n	0.237	sum(x)/n	
		1221	sum(y)^2	1.41	sum(x)^2	

#### Post-calibraiton

 Temperature (°F):
 75

 Temperature (°C):
 24

 Temperature (K):
 297

 BP (in Hg):
 30.01

 Pa (BP mm Hg):
 762

				Sample	ər	
	Orific	е				
	Flow	Qstd	%	Magn Flow	Mang Flow	%
Run No.	("H2O)	(m3/min)	difference	("H2O)	(corrected)	difference
2	5.50	0.253	-3.9	60	7.77	0.5

Sampling date:	9/10/99-9/11/99			
Location:	Site G, DW#1	m³/min	lpm	total m <sup>3</sup>
Sampler flow rate (m	<sup>3</sup> /min) = 1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)	0.213	213	307
m = samp	ler slope	31.0		
b = sample	er intercept	-0.37		
magn = av	verage magnehelic gage reading (inch H2O)	54		
average te	emperature during run (°F)	77		
Tav = ave	rage temperature (°K)	350		
average b	arometric pressure during run (in Hg)	29.94		
Pav = ave	rage pressure (mmHg)	761		
run start ti	me (ET 0.14)	944		
run end tin	ne (ET 24.37)	944		
total run tii	me (minutes)	1440		

Site Information	1
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PUF Model No.:

TE-1000PUF

Location: Sauget, IL Date:

9/8/99 **JDB**  Blower Model No.: TE-1004

**PUF** 

Operator: Temperature (°F): Magnehelic Serial No.: Sampler No.:

R990115ML20

Temperature (°C):

78 26 33

Temperature (K):

299

**Calibration Orifice** 

Elevation (ft):

568 (Lambert airport) 29.9

Model No.:

TE-5040A

BP (in Hg): Pa (BP mm Hg): 759

Serial No.:

0099

Calibration Date:

8/10/99

Qstd Slope (m):

9.71704

Qstd Intercept (b):

-0.032420

#### Pre-calibration

Qstd Magn Flow Mang Flow (m3/min) ("H2O) (corrected) Linear Regression 0.263 70 8.36
(m3/min) ("H2O) (corrected) Linear Regression
0.263 70 8.36
0.247 60 7.74 slope
0.227 50 7.06 intercept -
0.204 40 6.32 coor. Coeff 0.9
0.175 30 5.47
1.116 sum(y) 34.94
0.254 sum(y) sq 249
sum comb 7.96
n 5
0.223 sum(y)/n 6.99
1.25 sum(y)^2 1221

#### Post-calibraiton

Temperature (°F): 80 Temperature (°C): 27 Temperature (K): 300 BP (in Hg): 29.87 Pa (BP mm Hg): 759

				Sample	er	
	Orific	e				
	Flow	Qstd	%	Magn Flow	Mang Flow	%
Run No.	(*H2O)	(m3/min)	difference	("H2O)	(corrected)	difference
2	5.50	0.244	-1.1	60	7.72	-0.2

Sampling date:	9/9/99-9/10/99			
Location:	Site H, UP#1	m³/min	lpm	total m 3
Sampler flow rate (m 3/1	min) = 1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)	0.220	220	326
m = sample	r slope	32.7		
b = sampler	intercept	-0.31		
magn = ave	rage magnehelic gage reading (inch H2O)	63		
average tem	nperature during run (°F)	71		
Tav = avera	ge temperature (°K)	344		
average bar	ometric pressure during run (in Hg)	29.94		
Pav = avera	ge pressure (mmHg)	760		
run start time	e	1927		
run end time		2012		
total run time	e (minutes)	1485		

	Site Information		PUF	
Location:	Sauget, IL		PUF Model No.:	TE-1000PUF
Date:	9/8/99		Blower Model No.:	TE-1004
Operator:	JDB		Magnehelic Serial No.:	R9906107286
Temperatu	re (°F):	78	Sampler No.:	34
Temperatu	re (°C):	26		
Temperatu	re (K):	299		
Elevation (	ft):	568 (Lambert airport)	Calibration Orifi	ice
DD (in Hali		20 0	Model No .	TF-5040A

## Description | Park |

 Qstd Slope (m):
 9.71704

 Qstd Intercept (b):
 -0.032420

Pre-calibration

		oler	Samp			
			. •	e	Orific	
		Mang Flow	Magn Flow	Qstd	Flow	
	Linear Regression	(corrected)	("H2O)	(m3/min)	("H2O)	Run No.
		8.36	70	0.271	6.80	1
29.1	slope	7.74	60	0.256	6.05	2
0.34	intercept	7.06	50	0.234	5.05	3
0.9971	coor. Coeff	6.32	40	0.204	3.80	4
		5.47	30	0.175	2.80	5
	•	34.94	sum(y)	1.141	sum(x)	
		249	sum(y) sq	0.266	sum(x) sq.	5
		8.15	sum comb			
		5	n			
		6.99	sum(y)/n	0.228	sum(x)/n	
		1221	sum(y)^2	1.30	sum(x)^2	

Post-calibraiton

 Temperature (°F):
 82

 Temperature (°C):
 28

 Temperature (K):
 301

 BP (in Hg):
 30.01

 Pa (BP mm Hg):
 762

				Sample	er -	
	Orific	ce c		•		
	Flow	Qstd	%	Magn Flow	Mang Flow	%
Run No.	("H2O)	(m3/min)	difference	("H2O)	(corrected)	difference
2	6.10	0.257	0.2	60	7.72	-0.2

Sampling date:	9/10/99-9/11/99			
Location:	Site G, UP#2	m³/min	lpm	total m <sup>3</sup>
Sampler flow rate (m <sup>3</sup>	/min) = 1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)	0.206	206	297
m = sampl	er slope	29.1		
b = sample	er intercept	0.34		
magn = av	erage magnehelic gage reading (inch H2O)	57		
average te	mperature during run (°F)	80		
Tav = aver	age temperature (°K)	353		
average ba	arometric pressure during run (in Hg)	29.94		
Pav = aver	age pressure (mmHg)	760		
run start tir	me	1106		
run end tim	ne	1106		
total run tin	ne (minutes)	1440		

Site Information	· ·	PUF
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 Location:
 Sauget, IL
 PUF Model No.:
 TE-1000PUF

 Date:
 9/8/99
 Blower Model No.:
 TE-1004

 Operator:
 JDB
 Magnehelic Serial No.:
 R9906751R42

 Temperature (°F):
 78
 Sampler No.:
 35

Temperature (°F): 78 Sampler No.:

Temperature (°C): 26

Temperature (K): 299

Temperature (K): 299
Elevation (ft): Calibration Orifice

 BP (in Hg):
 29.9
 Model No.:
 TE-5040A

 Pa (BP mm Hg):
 759
 Serial No.:
 0100

 Calibration Date:
 8/10/99

 Qstd Slope (m):
 9.55896

 Qstd Intercept (b):
 -0.054620

Pre-calibration

			Sam	pler	<del></del>	
	Orific	ce				
	Flow	Qstd	Magn Flow	Mang Flow		
Run No.	("H2O)	(m3/min)	("H2O)	(corrected)	Linear Regression	n
1	6.50	0.272	70	8.36	***	
2	5.80	0.257	60	7.74	slope	31.1
3	4.95	0.238	50	7.06	intercept	-0.22
4	3.90	0.212	40	6.32	coor. Coeff	0.9962
5	2.80	0.181	30	5.47		
	sum(x)	1.160	sum(y)	34.94		
;	sum(x) sq.	0.275	sum(y) sq	249		
			sum comb	8.27		
			n	5		
	sum(x)/n	0.232	sum(y)/n	6.99		
	$sum(x)^2$	1.35	sum(y)^2	1221		

#### Post-calibraiton

 Temperature (°F):
 75

 Temperature (°C):
 24

 Temperature (K):
 297

 BP (in Hg):
 30.01

 Pa (BP mm Hg):
 762

				Sample	er	
	Orific	e		-		
	Flow	Qstd	%	Magn Flow	Mang Flow	%
Run No.	("H2O)	(m3/min)	difference	("H2O)	(corrected)	difference
2	6.15	0.266	3.3	60	7.77	0.5

Sampling date:	9/10/99-9/11/99			
Location:	Site L, DW#2	m³/min	lpm	total m <sup>3</sup>
Sampler flow rate (m 3/	(min) = 1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)	0.207	207	298
m = sample	er slope	31.1		
b = sample	rintercept	-0.22		
magn = ave	erage magnehelic gage reading (inch H2O)	53		
average ter	nperature during run (°F)	78		
Tav = avera	age temperature (°K)	351		
average ba	rometric pressure during run (in Hg)	29.94		
Pav = avera	age pressure (mmHg)	760		
run start tim	ne	1035		
run end time	e	1035		
total run tim	e (minutes)	1440		

Site Information		PUF	
Location: Sauget, IL		PUF Model No.:	TE-1000PUF
Date: 9/8/99		Blower Model No.:	TE-1004
Operator: JDB		Magnehelic Serial No.:	R990118ML42
Temperature (°F):	78	Sampler No.:	36
Temperature (°C):	26		
Temperature (K):	299		
Elevation (ft):	568 (Lambert airport)	Calibration O	rifice
BP (in Hg):	29.9	Model No.:	TE-5040A
Pa (BP mm Hg):	759	Serial No.:	0099
		Calibration Date:	8/10/99
		Qstd Slope (m):	9.71704
		Qstd Intercept (b):	-0.032420

#### Pre-calibration

		oler	Samp	1		
	•			e	Orific	
		Mang Flow	Magn Flow	Qstd	Flow	
	Linear Regression	(corrected)	("H2O)	(m3/min)	("H2O)	Run No.
		8.36	70	0.280	7.25	1
32.2	slope	7.74	60	0.261	6.30	2
-0.72	intercept	7.06	50	0.245	5.55	3
0.9973	coor. Coeff	6.32	40	0.220	4.45	4
		5.47	30	0.190	3.30	5
		34.94	sum(y)	1.197	sum(x)	
		249	sum(y) sq	0.292	sum(x) sq.	S
		8.53	sum comb			
		5	n			
		6.99	sum(y)/n	0.239	sum(x)/n	
		1221	sum(y)^2	1.43	sum(x)^2	

#### Post-calibraiton

Temperature (°F):	75
Temperature (°C):	24
Temperature (K):	297
BP (in Hg):	30.01
Pa (BP mm Hg):	762

<del></del>		<del></del>		Sample	er	
	Orific	:e				
	Flow	Qstd	%	Magn Flow	Mang Flow	%
Run No.	("H2O)	(m3/min)	difference	("H2O)	(corrected)	difference
2	6.30	0.263	0.5	60	7.77	0.5

Sampling date:	9/10/99-9/11/99			
Location:	Site L, DW#1	m³/min	lpm	total m 3
Sampler flow rate	(m <sup>3</sup> /min) = 1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)	0.211	211	304
m = sa	mpler slope	32.2		
b = sa	mpler intercept	-0.72		
magn :	average magnehelic gage reading (inch H2O)	51		
averag	e temperature during run (°F)	77		
Tav = :	average temperature (°K)	350		
averag	e barometric pressure during run (in Hg)	29.94		
Pav ≈	average pressure (mmHg)	760		
run sta	rt time	1019		
run en	d time	1019		
total ru	n time (minutes)	1440		

Site Information

Location: Sauget, IL Date:

Operator:

JDB

Temperature (°F): Temperature (°C):

Temperature (K): Elevation (ft):

BP (in Hg): Pa (BP mm Hg):

9/8/99

7B 26

299

29.9

759

568 (Lambert airport)

Model No.: Serial No.:

Calibration Date: Qstd Slope (m):

PUF Model No.:

Sampler No.:

Blower Model No.:

Magnehelic Serial No.:

Qstd Intercept (b):

**Calibration Orifice** 

**PUF** 

TE-5040A 0100

TE-1000PUF

R990115ML32

TE-1004

37

8/10/99

9.55896 -0.054620

#### Pre-calibration

		oler	Samp			
				e	Orific	
		Mang Flow	Magn Flow	Qstd	Flow	
	Linear Regression	(corrected)	("H2O)	(m3/min)	("H2O)	Run No.
		8.36	70	0.273	6.55	1
31.7	slope	7.74	60	0.259	5.90	2
-0.46	intercept	7.06	50	0.242	5.10	3
0.9940	coor. Coeff	6.32	40	0.216	4.05	4
		5.47	30	0.184	2.90	5
		34.94	sum(y)	1.174	sum(x)	
		249	sum(y) sq	0.281	sum(x) sq.	S
		8.36	sum comb			
		5	n			
		6.99	sum(y)/n	0.235	sum(x)/n	
		1221	sum(y)^2	1.38	$sum(x)^2$	

#### Post-calibraiton

Temperature (°F): Temperature (°C):

Temperature (K): BP (in Hg): Pa (BP mm Hg):

75 24 297

30.01 762

			1	Sample	<b>∌</b> Γ	
	Orific	:0				
	Flow	Qstd	%	Magn Flow	Mang Flow	%
Run No.	("H2O)	(m3/min)	difference	("H2O)	(corrected)	difference
2	5.75	0.257	-0.8	60	7.77	0.5

Sampling d	ate: 9/10/99-9/11/99			
Location:	Site L, DW#1	m³/min	lpm	total m <sup>3</sup>
Sampler flo	w rate $(m^3/min) = 1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)$	0.209	209	300
	m = sampler slope	31.7		
	b = sampler intercept	-0.46		
	magn = average magnehelic gage reading (inch H2O)	52		
	average temperature during run (°F)	77		
	Tav = average temperature (°K)	350		
	average barometric pressure during run (in Hg)	29.94		
	Pav = average pressure (mmHg)	760		
	run start time	1021		
	run end time	1021		
	total run time (minutes)	1440		

·....

Site Information	PUF
Courad II	DUE Madal Ma

 Location:
 Sauget, IL
 PUF Model No.:
 TE-1000PUF

 Date:
 9/8/99
 Blower Model No.:
 TE-1004

 Operator:
 JDB
 Magnehelic Serial No.:
 R990615ML23

 Temperature (°F):
 78
 Sampler No.:
 38

Temperature (°F): 78 Sampler No.:
Temperature (°C): 26
Temperature (K): 299

1.33

Elevation (ft): 568 (Lambert airport) Calibration Orifice

 BP (in Hg):
 29.9
 Model No.:
 TE-5040A

 Pa (BP mm Hg):
 759
 Serial No.:
 0099

Calibration Date: 8/10/99
Qstd Slope (m): 9.71704
Qstd Intercept (b): -0.032420

Pre-calibration

			Sam	pler	<del>'</del>	
	Orific	ce				
Run No.	Flow ("H2O)	Qstd (m3/min)	Magn Flow ("H2O)	Mang Flow (corrected)	Linear Regressior	1
1	6.80	0.271	70	8.36		<del></del>
2	6.00	0.255	60	7.74	slope	31.6
3	5.10	0.235	50	7.06	intercept	-0.30
4	4.00	0.209	40	6.32	coor. Coeff	0.9986
5	3.00	0.181	30	5.47		
	sum(x)	1.152	sum(y)	34.94		
;	sum(x) sq.	0.271	sum(y) sq	249		
			sum comb	8.22		
			n	5		
	sum(x)/n	0.230	sum(y)/n	6.99		
	, ,		107			

1221

#### Post-calibraiton

 Temperature (°F):
 75

 Temperature (°C):
 24

 Temperature (K):
 297

 BP (in Hg):
 30.01

 Pa (BP mm Hg):
 762

 $sum(x)^2$ 

	-			Sample	er	
	Orific	:e				
	Flow	Qstø	%	Magn Flow	Mang Flow	%
Run No.	("H2O)	(m3/min)	difference	("H2O)	(corrected)	difference
2	5.95	0.255	0.0	60	7.77	0.5

 $sum(y)^2$ 

Sampling da	ate: 9/10/99-9/11/99			
Location:	Site G, DW#1	m³/min	lpm	total m <sup>3</sup>
Sampler flo	w rate $(m^3/min) = 1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)$	0.210	210	302
	m = sampler slope	31.6		
	b = sampler intercept	-0.30		
	magn = average magnehelic gage reading (inch H2O)	55		
	average temperature during run (°F)	77		
	Tav = average temperature (°K)	350		
i	average barometric pressure during run (in Hg)	29.94		
1	Pav = average pressure (mmHg)	761		
1	run start time	943		
1	run end time	942		
1	otal run time (minutes)	1439		

Site Information		PUF	
Location: Sauget, IL		PUF Model No.:	TE-1000PUF
Date: 9/8/99		Blower Model No.:	TE-1004
Operator: JDB		Magnehelic Serial No.:	R990615ML21
Temperature (°F):	78	Sampler No.:	39
Temperature (°C):	26		
Temperature (K):	299		
Elevation (ft):	568 (Lambert airport)	Calibration O	rifice
BP (in Hg):	29.9	Model No.:	TE-5040A
Pa (BP mm Hg):	759	Serial No.:	0101
		Calibration Date:	8/10/99
		Qstd Slope (m):	9.47526
		Qstd Intercept (b):	-0.044390

Pre-calibration

			Sam	pler		
	Orific	се				
	Flow	Qstd	Magn Flow	Mang Flow		
Run No.	("H2O)	(m3/min)	("H2O)	(corrected)	Linear Regression	n
1	6.50	0.273	70	8.36		
2	5.65	0.255	60	7.74	slope	31.6
3	4.80	0.236	50	7.06	intercept	-0.33
4	3.80	0.210	40	6.32	coor. Coeff	0.9995
5	2.85	0.183	30	5.47		
	sum(x)	1.157	sum(y)	34.94		
	sum(x) sq.	0.273	sum(y) sq	249		
			sum comb	8.25		
			n	5		
	sum(x)/n	0.231	sum(y)/n	6.99	•	
	sum(x)^2	1.34	sum(y)^2	1221		

#### Post-calibraiton

 Temperature (°F):
 80

 Temperature (°C):
 27

 Temperature (K):
 300

 BP (in Hg):
 29.87

 Pa (BP mm Hg):
 759

				Sample	er	
	Orific	:е				
	Flow	Qstd	%	Magn Flow	Mang Flow	%
Run No.	("H2O)	(m3/min)	difference	("H2O)	(corrected)	difference
2	5.30	0.247	-3.4	60	7.72	-0.2

Sampling date:	9/9/99-9/10/99			
Location:	Site H, UP#1	m³/min	lpm	total m <sup>3</sup>
Sampler flow rate	(m <sup>3</sup> /min) = 1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)	0.205	205	305
m = sa	mpler slope	31.6		
b = sar	npler intercept	-0.33		
magn =	average magnehelic gage reading (inch H2O)	50		
averag	e temperature during run (°F)	71		
Tav = a	average temperature (°K)	344		
averag	e barometric pressure during run (in Hg)	29.94		
Pav = a	average pressure (mmHg)	760		
run sta	rt time	1925		
run end	f time	2012		
total ru	n time (minutes)	1487		

& ENVIR	NNAH LABORATO ONMENTAL SERVICES, INC EST AND CHAIN OF CU	<b>C</b> .	Г⊒ 2846 [⊒ 414 [⊒ 900 [⊒ 6712	LaRoche Avenue 5 Industrial Plaza D SW 12th Avenue, I Lakeside Drive, Mi 2 Benjamin Road, S Alpha Drive, Suite	irive, Tallah Deerfield B obile, AL 36 Suite 100, 1	nassee, FL 32301 each, FL 33442 6693 Fampa, FL 33634	Phone: (954 Phone: (334 Phone: (813	8) 878-3994 8) 421-7400 8) 666-6633	Fax: (912) 35: Fax: (904) 87: Fax: (954) 42 Fax: (334) 66: Fax: (813) 88 Fax: (504) 72	8-9504 1-2584 6-6696 5-7049
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4/10/99/19/15	AIR - M - 3		XX							
9/10/99 1534	A16-M-4		MX							
9/10/94/1858	MC - M - 5		XX							
9/10/49 1920	AIR-M-C	,	XX							
9/11/99/0933	NI - M - 7		XX							
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SL SAVANNAH LA & ENVIRONMENTAL S ANALYSIS REQUEST AND CH	SERVICES, INC.	☐ 2846 Indus ☐ 414 SW 12 ☐ 900 Lakesi ☐ 6712 Benja	che Avenue, Savanna trial Plaza Drive, Talla th Avenue, Deerfield I de Drive, Mobile, AL 3 imin Road, Suite 100, Drive, Suite 110, Dest	hassee, FL 32301 Phone Beach, FL 33442 Phone 6693 Phone Tampa, FL 33634 Phone	e: (904) 878-3994 Fax e: (954) 421-7400 Fax e: (334) 666-6633 Fax e: (813) 885-7427 Fax	c: (912) 352-0165 c: (904) 878-9504 c: (954) 421-2584 c: (334) 666-6696 c: (813) 885-7049 c: (504) 725-1163	
PROJECT LOC   SAMPLER(S) NAME B. II I (State)   L. Al. A. C. L. T. II I CLIENT NAME SOLUTION IN CLIENT ADDRESS (CITY, STATE, ZIP)	PROJECT NO.  PO NUMBER  235.16 (710.00)  PHONE 314 6.42  VI	MATRIX TYPE  - 1550  - 7266  Y  SING STATE OF THE STATE O		REQUIRED ANALYSES		STANDARD REPORT DELIVERY  EXPEDITED REPO DELIVERY(surchar	ORT
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## SAVANNAH LABORATORIES **& ENVIRONMENTAL SERVICES, INC.**

#### ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

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## SL AVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

## ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

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1 2846 Industrial P	laza Drive, Tallahassee, FL 32301	Phone: (904) 878-3994	Fax: (904) 878-9504
[] 414 SW 12th Av	enue, Deerfield Beach, FL 33442	Phone: (954) 421-7400	Fax: (954) 421-2584
(1) 900 Lakeside Dr	ive, Mobile, AL 36693	Phone: (334) 666-6633	Fax: (334) 666-6696
🗀 6712 Benjamın F	Road, Suite 100, Tampa, FL 33634	Phone: (813) 885-7427	Fax: (813) 885-7049
[ ] 100 Alpha Drive,	Suite 110, Destréhan, LA 70047	Phone: (504) 764-1100	Fax: (504) 725-1163

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### 3.23. Pilot Test Sampling

#### 3.23.1. Rationale/Design

Treatability pilot tests were conducted on wastes in order to identify any characteristics of these materials that would prevent their treatment using off-site incineration.

Waste treatability pilot tests for on-site thermal desorption were also planned. Although samples were collected for this effort, an appropriately permitted contractor was not identified to accept the samples.

Leachate treatability pilot testing was conducted to evaluate the appropriate combination of physical/chemical and/or biological treatment processes that are needed to achieve pretreatment requirements for discharge to the American Bottoms publicly owned treatment works (POTW). Leachate from Sites G and I was considered representative of leachate found in the fill areas.

Sediment treatability pilot tests for on-site thermal desorption and stabilization were also planned. However, a deviation (Section 3.23.4.1) was submitted and approved to cancel these plans, based on correspondence between Solutia and USEPA Region V.

Off-Site Waste Incineration - One composite organic waste sample was made from waste samples collected from one of the waste characterization borings installed at each fill area (Boring B3 on Site G, B3 on H, B2 on I, B4 on L, and B1 on N). Borings were selected by Roux Associates, Inc. based on review of boring logs from waste sampling. This sample was sent to one RCRA/TSCA-permitted, fixedincinerator for waste profiling, material characterization, and evaluation of the feasibility of disposing of the waste material by off-site incineration. The sample was submitted to SafetyKleen in Coffeyville, Kansas. SafetyKleen in Coffeyville, Kansas is the only incineration facility permitted to accept dioxin-containing materials from RCRA-listed processes.

Leachate Treatment – Leachate treatability pilot tests were conducted on samples collected from Sites G and I to evaluate if pretreatment limits can be achieved prior to discharge to the American Bottoms POTW. One leachate sample was collected from Site I, and one leachate sample was collected from Site G using the two-inch-diameter well installed at each of these fill areas as part of the Waste Characterization Sampling Plan. As directed by USACE, these wells were stressed so that a representative leachate sample could be collected. Pumping was limited by constraints imposed by leachate storage and disposal requirements. Pilot treatability testing was conducted by the ADVENT Group, Brentwood, Tennessee.

#### 3.23.2. Field Procedures

Prior to performing field work, Preparatory Inspection Meetings attended by a representative of each of the interested parties were completed (Section 3.23.4.2).

Fill Areas – The borings were advanced using conventional hollow-stem auger drilling methods. Samples were collected using a five-foot continuous sampler. The samples were selected for compositing by visual and PID analysis and placed into sealable five-gallon buckets for storage prior to compositing and shipment to treatment facilities. In cases where insufficient sample volume was recovered from the sampler, the drill cuttings were collected. This procedure was repeated over the approximate depth of waste/fill, based on field observations and boring logs from waste sampling. A grab sample from each site was used to make up a composite waste sample.

Leachate Sample – Leachate samples were collected generally following procedures outlined in Section 3.7.3. Wells were pumped at a rate that allowed continuous discharge without drying up the well, and sufficient volume was pumped to enable water from at least one foot away from the filter pack to be drawn into the well before a sample was collected. Approximately 80 gallons was purged from each well prior to sampling. The ADVENT Group was contacted to establish sample quantity and container requirements.

#### 3.23.3. Documentation

Deviation to not perform sampling for both sediment thermal desorption and sediment stabilization is included in Section 3.23.3.1. Field logs generated are included in Record Book Nos. 2, 3, and 4 (Appendix D). Ground water sampling logs for the leachate sampling are included in Section 3.23.3.3. Chain-of-custody forms are included in Section 3.23.3.4.

Documentation for this task continues on the next page.

## 3.23.3.1. Change Orders and Deviation/Clarification Log

# **DEVIATION LOG**

DIVIDUAL REQUESTING DEVIATION / COMPANY:		DATE 03 Apr 00
DE Haverdink / O'Brien +C	réve	
HEALTH & SAFETY APPROVAL REQUIRED: YES: _	NO: <u>X</u>	_
PROJECT NAME Solutia - Sauget Area/	PROJECT LOCATION	Dead Creek, STRM
WEATHER PRECIPIT	ATION	TEMPERATURE
NUMBER OF HOURS WORKED	NUMBER OF EMPLOYE	£\$
1 CONTRACT ITEM BEING WORKED ON	·	
2 ITEM BEING DEVIATED (REF APPROP SEC OF	F FSP/HASP)	
3 PEASON FOR DEVIATION: 4 CEVIATION OR FIELD CHANGE TO BE IMPLEME	ENTED:	
5 EQUIPMENT: 6 DEVELOPMENTS WHICH MIGHT LEAD TO ISSU	ANCES OF A CHANCE OFFI	DOD DE TUE DAGIC OF A CLAIR
(EQUIPMENT: TIME: MANPOWER: ETC.):	ANCES OF A CHANGE ORDE	R OR SE THE BASIS OF A CLAIM
7 REMARKS:		
(1) Pilot test sampling for sedie	monts	
(2) FSP #5.23		·
(3) Deviation based on conversation  Mc Ateer (USEPA).	ons be tween Mike Light	st (Soluta) and Mike
(9) Pilot test sampling for on-size	sediment thermal desor	ption and sediment
stabilization will not be co	AND CHAIR	
P N/A		
6 None		
(7) None		
CC: K. Perry O34PROD		· · · · · · · · · · · · · · · · · · ·
USEP4 C/700		
TEHaverdink Do Haverding	1 Genter - Peron	1/3/00
PRINTED NAME / SIGNATURE OF PREPARER	PRINTED NAME / SIGN	ATURE OF SOLUTIA REP / DATE
as Apr 00		
DATE	PRINTED NAME / SIGN	ATURE OF USEPA REP / DATE
F ADDITIONAL SPACE IS REQUIRED.  RECORD ON REVERSE SIDE		

## 3.23.3.2. Preparatory Inspection Meeting Form

# PREPARATORY INSPECTION MEETING

1. Scheduled Work:  2. Equipment, Procedures, Personnel:  3. Ref. To App. Sec. of FSP/HASP:  4. Issues that could arise and how to resolve:  5. Solutia comments:  6. EPA comments:  7. 7. 7. 8. 8. 8. 8. 8. 8. 8. 8. 8. 8. 8. 8. 8.	Conducted by/Company: DE Haverdink	O'Brien + Gere	Date: 12 Acc 00
2. Equipment, Procedures, Personnel:  3. Ref. To App. Sec. of FSP/HASP:  4. Issues that could arise and how to resolve:  5. Solutia comments:  6. EPA comments:  7. "  6. EPA comments:  7. "  6. EPA comments:  7. "  7. Pilet feet haste sampling  7. Equipment collect up to It Sept metals at each boring learning; collect up to It Sept heaters at feelber; is Bet him; collect vaste over total fill depts; learning at feelber; is Bet him; collect vaste over total fill depts; learning at feelber; is Bet him; collect vaste over total fill depts; learning at feelber; select waste for compensing by visual 4 1/10 analysis; ship sample for incommental terms for compensing by visual 4 1/10 analysis; ship sample for incommental terms for compensing by visual 4 1/10 analysis; ship sample for incommental terms for compensing by visual 4 1/10 analysis; ship sample for incommental terms for compensions by visual 4 1/10 analysis; ship sample for incommental terms for compensions by visual 4 1/10 analysis; ship sample for incommental terms for compensions of the	Project Name: Sutra - Sauget Area!	Task: Pilot to	est sampling - waste
2. Equipment, Procedures, Personnel:  3. Ref. To App. Sec. of FSP/HASP:  4. Issues that could arise and how to resolve:  5. Solutia comments:  6. EPA comments:  7. "  6. EPA comments:  7. "  6. EPA comments:  7. "  7. Pilet feet haste sampling  7. Equipment collect up to It Sept metals at each boring learning; collect up to It Sept heaters at feelber; is Bet him; collect vaste over total fill depts; learning at feelber; is Bet him; collect vaste over total fill depts; learning at feelber; is Bet him; collect vaste over total fill depts; learning at feelber; select waste for compensing by visual 4 1/10 analysis; ship sample for incommental terms for compensing by visual 4 1/10 analysis; ship sample for incommental terms for compensing by visual 4 1/10 analysis; ship sample for incommental terms for compensing by visual 4 1/10 analysis; ship sample for incommental terms for compensions by visual 4 1/10 analysis; ship sample for incommental terms for compensions by visual 4 1/10 analysis; ship sample for incommental terms for compensions of the	1. Scheduled Work:	sec la la c	-
3. Ref. To App. Sec. of FSP/HASP:  4. Issues that could arise and how to resolve:  5. Solutia comments:  6. EPA comments:  7. "  9. Pilot fest full rig + deviling eg up. 5 fal scalable buckets. PHE Menitoring eguip.  Residence: Collect up to 3.7 Sgal buckets at each boring location; collect waste over total fill depth. Iscatums as folkers: 6 ft. H. H. B. I. F. P. L. C. C. L. L. L. L. L. L. L. L. L. L. L. L. L.		/ I'	
4. Issues that could arise and how to resolve:  5. Solutia comments:  6. EPA comments:  7. Pilot feet Laste sampling  7. Equip. Arill Fig. 4 dilling equip. Sign! sealable buckets PE Monitoring equip.  1. Proceedures:  6. EPA comments:  7. Pilot feet Laste sampling  7. Equip. Arill Fig. 4 dilling equip. Sign! buckets at each foring location; collect waste over tools fill depth. Iterations at folkers:  8. Et and location is advance borness using location; collect waste for the most sample for increasing the sample for the most for compositing the visual 4 till analysis: Step sample for increasing treatments for compositing for the mal desort. Heat ability. Personal desort. Heat ability.  1. Exercised for the filling of		FSP # 5 27 HAS	P# 14
5. Solutia comments:  (6. EPA comments:  (7. Pilot fest Laste sempling  (8. Epa comments:  (8. Pilot fest Laste sempling  (9. Epa p. drill rig + drilling eg up., Sgal sealable buckets, PRE, monitoring egnip.  (10. Productive: Collect up to 3' Sgal buckets at each boring location; collect waste gover total fill dest . Icentrons at follows: G. B.R., H.B.R., I.R.R., L.B.R.,	The second secon		
Definition that paste sempling  Definition that paste sempling  Definition to desiling equip. Signal buckets, 1th monitoring equip.  Providence: Collect up to 3' Signal buckets at each boring provision; collect vaste over total fill depth; beautions as follows: G. Bit., 4 Bit., I RZ, 104  N. B.I. (past Power thios.); advance borings using hollow stem anger methods; collect samples using 5-4 continuous samples, select work for compositing by visual 4 IID analysis: Supremple for inconstitution treatability, hold sample for inconstitution treatability, hold sample for some I desiling thereis sample collection. OBG  (3) Some about  (4) Not enough receive a perform another bosine in adjacent lises from  (5) some: requested maps of each boring is eather to be stored in field of size stand, labeled, pending stronger.  (6) none  ATTENDANCE:  EMPLOYEE NAME (print) EMPLOYEE SIGNATURE COMPANY  Windows A. Labeled, pending stronger.  ATTENDANCE:  EMPLOYEE NAME (print) EMPLOYEE SIGNATURE COMPANY  Windows A. Labeled, pending stronger.  ATTENDANCE:  EMPLOYEE NAME (print) EMPLOYEE SIGNATURE COMPANY  Windows A. Labeled, pending stronger.  ATTENDANCE:  EMPLOYEE NAME (print) EMPLOYEE SIGNATURE COMPANY  Windows A. Labeled, pending stronger.  ATTENDANCE:  EMPLOYEE NAME (print) EMPLOYEE SIGNATURE COMPANY  Windows A. Labeled, pending stronger.  ATTENDANCE:  EMPLOYEE SIGNATURE COMPANY  WINDOWS A. Labeled, pending stronger.  ATTENDANCE:  EMPLOYEE SIGNATURE COMPANY  WINDOWS A. Labeled, pending stronger.  ATTENDANCE:  EMPLOYEE SIGNATURE OF PREPARER   OB 6  CC: BK. Perry 4-13-00  U. Self C. 1745  IF ADDITIONAL SPACE IS REQUIRED.  PRINTED NAME SIGNATURE OF PREPARER	5. Solutia comments:	Is at	
Description of the time of a collection of the state of t	6. EPA comments:	л //	
Description of the time of a collection of the state of t	@ Pilot test waste sampling		
Over total fill depth: licethons as follows: & B3, I B		up., 5-gal sealable buck	Lets, PAE, Monitoring equip.
Over total fill depth: licethons as follows: & B3, I B	Procedures: collect up to 3/x 5ga	I buckets at each borin	a location; collect waste
(a)/ect Samples using 5-f Continuous samples, select with for compositing by visual + 1/10 enalysis; ship sample for incharation treatability, half sample for the male desorth. Heatability.  For some of desorth treatability.  For some about  (9) Not enough recovery - perform another bottle in adjustant location.  (S) some inquested maps of each bottle in adjustant location.  (G) none  ATTENDANCE:  EMPLOYEE NAME (print)  EMPLOYEE SIGNATURE  COMPANY  Kindow TROM  Land M. L. H.  Land M. L. H.  Land M. L. H.  Land M. L.			
by risual + 110 enalysis; ship sample for incharation treatability.  Ger thermal desorb. Heatability  Personal: drilling + Herrier samp. collection + OBG  See above  (2) see above  (3) see above  (4) not enough receive + perform another horing in adjacent location  (5) stone: requested maps of each boring is adjacent location  of shid, labeled, jending ship must  (6) none  ATTENDANCE:  EMPLOYEE NAME (print)  EMPLOYEE SIGNATURE COMPANY  Kinden - Ro Land Missing Ship must  Under the first of the first of the first of the ship of the first of the ship of the first of the fi	N BI (per Roux Assoc.); as	trance bornes using how	lbs stem anger nethods,
Grant desorb. Heatebilly  Personne : drilling thereir samp. collection to OBG  (3) Some above  (9) Not enough recovery the form another boring in adjacent location  (S) some requested mans of each boring is adjacent location  of shed, labeled, leading shipmant  (6) None  ATTENDANCE:  EMPLOYEE NAME (print)  EMPLOYEE SIGNATURE  COMPANY  Kinden There is a light of the ship shipmant  Company  Kinden There is a light of the ship shipmant  Company  Kinden There is a light of the shipmant  Company  Kinden There is a light of the shipmant  Kinden There is a light of the shipmant  Company	collect samples using 5-4	continuous samples, sel	lect with for compositing
Personnel: drilling - Harrist , samp, collection - OBG  (3) Some a home  (4) Not enough recovery - perform another horing in adjacent location  (5) Atome: requested maps of each boring location; backets to be stored in field  ofe stad , labeled, jending shipment  (6) None  ATTENDANCE:  EMPLOYEE NAME (print)  EMPLOYEE SIGNATURE COMPANY  Kimber - Ro	by visual of 11D analysis: s	this sample for incineration	treatability, hold sample
(3) See a bone  (9) Not enough recents = perform another boring in editation to be shorted in first of the start of the st			
ATTENDANCE:  EMPLOYEE NAME (print)  EMPLOYEE SIGNATURE  COMPANY  Linbert PRO  Lind M. L. J. L. L. L. L. L. L. L. L. L. L. L. L. L.		samp. collection - 08G	<u>,                                    </u>
ATTENDANCE:  EMPLOYEE NAME (print)  EMPLOYEE SIGNATURE  COMPANY  Kinder TRO  Land M. Land  Land M. L	- <del> </del>		
ATTENDANCE:  EMPLOYEE NAME (print)  EMPLOYEE SIGNATURE  COMPANY  Kinder Real Maris  In Maris  Kinder Real Maris  In Maris  Kinder Real Maris  In Maris  Kinder Real Maris  In Maris  Kinder Real Maris  Kin	(4) Not enough recovery > perform another	er boring in adjacent local	420
ATTENDANCE:  EMPLOYEE NAME (print)  EMPLOYEE SIGNATURE  COMPANY  Kinder Re Land Land All All Hours  In D. M. & Harris Hours  In C. A. & Harris MANUTALLE  Nick Jankins  If ADDITONAL SPACE IS REQUIRED.  RECORD ON REVERSE SIDE  RECORD NAME / SIGNATURE OF PREPARER	(\$) ****	1 to 1 to 1 to 1	to to be closed a field
ATTENDANCE:  EMPLOYEE NAME (print) EMPLOYEE SIGNATURE COMPANY  Kinbert of Roman Spirit Spirit Homiss  Time Crank Homiss  Kind Appetry Markins  Mick Jankins Mickellia 086  CC MK. Perry 4-13-00  11 Self C 1745  IF ADDITONAL SPACE IS REQUIRED.  RECORD ON REVERSE SIDE PRINTED NAME/SIGNATURE OF PREPARER		,	A B CE Starte In Hela
ATTENDANCE:  EMPLOYEE NAME (print) EMPLOYEE SIGNATURE COMPANY  Kinder Romand Solver So		n if her	
EMPLOYEE NAME (print)  EMPLOYEE SIGNATURE  COMPANY  Lind of Solida  Lind of So			
EMPLOYEE NAME (print)  EMPLOYEE SIGNATURE  COMPANY  Lind of Solida  Lind of So			
Kinber 7 Ron Schill Solta Houss  I'm Crank Houss  Kin Cark Houss  Kin Cark Houss  Mick Jenkins William 036  CC: BK, Pein 4-13-00  11 Sept C 1745  If ADDITONAL SPACE IS REQUIRED.  RECORD ON REVERSE SIDE  RECORD NAME/SIGNATURE OF PREPARER			
Nick Jankins  Rick Jankins  Rick Jankins  OBE  CC BK, Perry 4-13-00  LISEPA C 1745  IF ADDITONAL SPACE IS REQUIRED.  RECORD ON REVERSE SIDE  RECORD NAME SIGNATURE OF PREPARER	EMPLOYEE NAME (print) EMPLO	YEE SIGNATURE COI	MPANY
Nick Jankins  Rick Jankins  Rick Jankins  OBE  CC BK, Perry 4-13-00  LISEPA C 1745  IF ADDITONAL SPACE IS REQUIRED.  RECORD ON REVERSE SIDE  RECORD NAME SIGNATURE OF PREPARER	Kinber 7 Rom Stant		op/cHa
Nick Jankins  Rick Jankins  Rick Jankins  OBE  CC BK, Perry 4-13-00  LISEPA C 1745  IF ADDITONAL SPACE IS REQUIRED.  RECORD ON REVERSE SIDE  RECORD NAME SIGNATURE OF PREPARER	and M. & St.	UMX SEX	Hanss
CC: LOK, Perry 4-13-00  USEPA C 1745  IF ADDITONAL SPACE IS REQUIRED.  RECORD ON REVERSE SIDE  PRINTED NAME SIGNATURE OF PREPARER	Tipy CANK	topp 1	1011155
CC: LOK, Perry 4-13-00  USEPA C 1745  IF ADDITONAL SPACE IS REQUIRED.  RECORD ON REVERSE SIDE  PRINTED NAME SIGNATURE OF PREPARER	K SN CAFFERTY	1. 1	MAVERICIE
IF ADDITIONAL SPACE IS REQUIRED.  RECORD ON REVERSE SIDE  PRINTED NAME SIGNATURE OF PREPARER	Nick Jankins Michel	Wills	036
IF ADDITONAL SPACE IS REQUIRED.  RECORD ON REVERSE SIDE  PRINTED NAME/ SIGNATURE OF PREPARER			
RECORD ON REVERSE SIDE PRINTED NAME/ SIGNATURE OF PREPARER	CC BRITERY 4-13-00		
RECORD ON REVERSE SIDE PRINTED NAME/ SIGNATURE OF PREPARER	LIDENAL GITTS		
RECORD ON REVERSE SIDE PRINTED NAME/ SIGNATURE OF PREPARER	IF ADDITONAL SPACE IS REQUIRED.	DEHaverdink /De	5 Hours
12 Apr Or		PRINTED NAME/SI	
DATE			

# PREPARATORY INSPECTION MEETING

Conducted by/Company: O'Briand Gere	Date: 25Aprud
Project Name: Solutiz - Szuget Arez 1	Task: bereinte well sempling
<u> </u>	
1. Scheduled Work: Sample leuter well	la buted et sites G+I.
2. Equipment, Procedures, Personnel:	
	7.3 / HASP 2.6
4. Issues that could arise and how to resolve:	
5. Solutia comments:	
6. EPA comments:	
@ Perishlic pumps, twing, PID, U	- 525 meter, semple containers, level C
PPE, STgallon drums, water level q	onbe, betteries
	ot when table, monitoring zing insent
tising for a peritally pumps to	1) 2 hove bottom it well czachay
Connect through pumps to sy	erbour munitionen et zin up 4 down
- vatil more tilled p	eribuit munituria at zin up 4 00 wh
wind in the breathing zune,	2ther the Desin to
	t ground inter simple log sheet send
Simples to Szuznach for Zr	relyses ettrebed of Triengle ber Dias.
znalysis, label & stage drums	s abject to lesimine wells
Personal include 2 0B6 en	
TERSONNET INCHULE A DISS EN	~DIOYECS
A) I ssurs that could soise includ	ه و
A) count water exceed a sich	on coperating at perstaltin-solution ->
use either brilers ur	e con from our
ATTENDANCE:	Ouer->
EMPLOYEE NAME (print) EMPLOYEE SI	
COLIN WEILENKAMY Colin	Sello any Ciso
William E. Wright heillight	What By
Nick Jenkins Jak And	006
Kanlargary Coly	MOURRICK
Kinker Jem Kithy	Solita
CC! K. Perry 25 Aproo	
USEPA 1830	
IF ADDITIONAL CRACE IS REQUIRED.	mkelesis/Lt/P.U
IF ADDITONAL SPACE IS REQUIRED,  RECORD ON REVERSE SIDE	PRINTED NAME/ SIGNATURE OF PREPARER
100000.10.200	00-04 7C
	DATE

- (continued)
  - @ well goes dry solution -> record in log book of zllow well to recover
  - @ Dir monitoring exceeds level C thrushold of 49.9 solution -> turn of pumps & cover wells & benedls & monitor zir up &
    Down wind in the breething zones, When monitoring results
    fell below required level begin pump operation & sempling
- 3 none

6 none



**DATE/TIME PRINTED: 04.10.00/03:18PM** 

5102 LaRoche Avenue • Savannah, GA 31404 • (912) 354-7858 • Fax (912) 352-0165 • www.stksivlab.com

Shipping Address: O'Brien & Gere

5000 Cedar Plaza Parkway Suite 211

St. Louis, MO 63128

ATTN: BILL WRIGHT

Date of Shipment: 04/10/00

Method of Shipment: FEP

Project Reference: SA1/SSP-Leachate Treatabilit

Project Site Location: IL

Phone No: 314/842-4550

Account No: 1187-9587-3

#### SAMPLE CONTAINER REQUEST FORM

1											MAIL		,,,,,	AIME	n nc	400	<del></del>	- Chin	<del></del>
			AQU	EOU	s	·													
	0	0	0	R	R	LB	В	0	0	0	G	LB	0				<u> </u>		PRESERVATIVES
	L n/m amber glass w/TFE	L n/m ember glass w/TFE	L n/m amber glass w/TFE	600 mL m/m plastic	250 mL m/m plastic	40 mt. vial w/TFE	500 mL·m/m plestic	t n/m amber glass w/TFE	L n/m plastic	500 ml. m/m plastic	250 mL m/m plastic	125 mL m/m amber glass w/TFE	L n/m plastic						Lab Pk Prep. by:  Lab Pk Checked by:  Quantity of Lab Pks. Shipped:  Proj Mgr: Angle Stewart  Coordinator: Christina Williams  Comments: MARK BOXES
•	6	6	6	3	3	12	3	6	3	3	3	3	3						NO. OF CONTAINERS SHIPPED
d	2	2	2	1	1	3	1	2	1	1	1	1	1						NO. OF CONTAINERS/SAMPLE
	•					1	•	•					7						SET(S) OF TRIP BLANKS (3/SET)
	SVOC-8270	PCB-680	PEST-8081	METALS-6010	MERCURY STATE ZY 70.4	VOC-8280	CYANIDE-9010	HERBICIDES-8161	BOD/SS	General analyses Conductively 50/Pour / ADa / C. / BH/cdm	Ĭ	TOC ,	TDSN8S/ TD15	•					ANALYSIS

It is the shipper's responsibility to ensure samples are maintained at the appropriate temperature during transit.

### PRESERVATION COLOR CODE KEY

BLACK(BK) MCACE Contains Monochloroscetic Acid. Avoid skin and eye contact. If contact is made, FLUSH IMMEDIATELY with water. CAUTIONI STRONG OXIDIZERI CONTAINS NITRIC ACID. Avoid skin and eye contact. If contact is made,

RED(R) **HNO3** FLUSH IMMEDIATELY with water.

H2SO4 CAUTION! CONTAINS SULFURIC ACID. Avoid skin and eye contact. If contact is made, FLUSH IMMEDIATELY with water. GREEN(G)

CAUTIONI STRONG CAUSTICI CONTAINS SODIUM HYDROXIDE. Avoid skin and eye contact. If contact is made, BLUE(B) NAOH

FLUSH IMMEDIATELY with water.

WHITE(W) NONE No preservatives added. ORANGE(O) NONE No preservatives added.

ZN-ACE Contains Zinc Acetate. Avoid skin and eye contact. If contact is made, FLUSH IMMEDIATELY with water. TAN(T)

YELLOW(Y) NA2SS04 Contains Sodium Thiosulfate.

CAUTIONI CONTAINS HYDROCHLORIC ACID. Avoid skin and eye contact. If contact is made, FLUSH LT.BLUE(LB) HCL

IMMEDIATELY with water.

NAHSO4

MEOH **ASC-ACID** 

ŧ

DO NOT inhale vapors that may be caused from a chemical reaction between the preservative and sample. Collect sample in a well-ventilated area or use appropriate breathing apparatus. NEVER RINSE sample containers. If skin contact with preservatives occurs, flush exposed areas IMMEDIATELY.

## 3.23.3.3. Ground Water Logs

# Lezchete 2 Gourdneter Surplins

O'BRIEN & SERE ENGINEERS, INC	Ground	Water Sampling Log	
Date: 7/19/00 Site Name Sinct - 5. to 6 Site Location Sinct Area 1 Personnel Transcript Area 1	<b>ш</b> р	Weather: Well Number: Project Number: Evacuation Method	Pirtly Sunny LEACH-G 23545 Condition Pump
Depth of Well * 32 At ft.  Depth to Water * /*/ ft.  Length of Water Column  Volume of Water in Well gal.(s)  3X Volume of Water in Well gal.(s)	4" Diar	neter Well = 0.163 X LV neter Well = 0.653 X LV neter Well = 1.469 X LV	NC NC NC No X
*Measurements taken from Top of We	ell Casing	Top of Protective C	asing (Other, Specify)
Water parameters:  Temperature Reading  Temperature Reading  after (gal.) after (gal.) after (gal.) Water Sample Time Collected:  1500	pH Res  4.0 Standard  7.0 Standard  10.0 Standard  initial  after (gal.)  after (gal.)  after (gal.)  after (gal.)	ading	Conductivity Reading  84 S Standard  1413 S Standard  initial  after (gal.)  after (gal.)  after (gal.)  after (gal.)  after (gal.)  after (gal.)
Physical Accearance at Start	Physic	al Appearance at Samp	ling
Color Count Crown Odor Yes Turbidity (> 100 NTUs) Not Analyzed Sheen/Free Product Not Confirmed		ity (> 100 NTU's) /Free Product	Not Employed
Sample Parameters: Dane			
Container Size Container Type  1 5 2 1 2	# Collected Filter	ice	pH Temp. Conductivity
Monitoring Well Integrity Checklist:  Well identification number clearly marked?	well stand pipe and PVC かみつ	Yes Yes Yes Strol Yes casing? Sted Yes bscarcd Yes	No
Depth to Ground Water: Ground Water Elevation:			

Lerchite 2 Gowneter Simpling

O'BRIEN & GERE ENGINEER	RS, INC.		Ground Wa	ater Sampling Log			
-1.4					O.	11 5	
Date: ///1/00	3.kI			Weather:	بع الم	<del>سرم ک</del>	- TUDY
Site Name Souget			_	Well Number:	<del>کسا ۔۔۔</del>	354	<u>-</u>
Personnel: 7. Tr Sesce				Project Number: Evacuation Method:		met	
reisonner. The cesses	, 4 C Dellencemp	<del></del>	_	EVACUATION (VIEU IOC.		) I ONE.	or tomp
Depth of Well * Depth to Water * Length of Water Column Volume of Water in Well 3X Volume of Water in Well	30 ft. 75 ft. ft. gal.(s) gal.(s)		4" Diamete 6" Diamete emoved befor	r Well = 0.163 X LV r Well = 0.653 X LV r Well = 1.469 X LV re sampling	vc vc		gal.(s)
*Measurements taken from	Top of W	Vell Casing		Top of Protective C	sing		(Other, Specify)
Temperatu  after (gal.) after (gal.) after (gal.) after (gal.) (gal.)	re Reading	4.9-Stance 7.0 Stance 10.0 Starre initial after after after after after	<b>a</b> rd		after after after after, after	84 S Star 1413 S S initial	
Water Samole: Time Collected:	<u>15</u>						
Physical Accearance at Start			Physical A	ppearance at Samp	ing		
	1. 1 R - 1					iλ	R- IRLL
Color	1000A Dum		Color			10074	Brewn/Black
Odor Turbidity (> 100 NTUs)	Not Sully 200		Odor Turbidity (2	100 NTU's)		<u>۲۲ ۵</u>	<u> </u>
Sheen/Free Product 436			Sheen/Free			t cun	
		<del></del>	0.100.07.10			1 127.5	
Sample Parameters:	None						
Container Size	Container Type	# Collected	Filtered	Preservative	pН	Temp.	Conductivity
1921120	plastic	35	no	ice.			
				<del></del>	<u> </u>	<u> </u>	
	+	·		<del></del>		<u> </u>	1
	<del> </del>		+		<del></del>	-	
			1		<del>†</del>	<u>:                                    </u>	
					i		
					i		
		L					<u> </u>
Monitoring Well Integrity Chec Well identification number clea Well covers and locks in good Is the well stand pipe vertically Is the concrete pad and surfac Are soils surrounding the well Is the PVC well casing in good Is there standing water in the Is the stand pipe vented at the Does the total depth of the we	arly marked?	5 te. e well stand pipe 2	nd PVC casi	Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes	×××××××××××××××××××××××××××××××××××××××	No No No No No	<u>×</u>
NOTES Top of casing el- Depth to Ground Ground Water E	evation: d Water: Elevation:	- - -					•

# 3.23.3.4. Chain-of-Custody Forms

Project Name:Support Sampling . So Job No	auge o.	Area ŽŽ	بإكا	e, So	lutia	Inc	:
	_		Chase				

Office: _	11 4	ouis.	MO	_ 5/2	7
_	_			1:11 Pd.	
			- 45		

### CHAIN OF CUSTODY

Cooler Temperature

CLIENT: Solution, Inc. LOCATION: Souge Area!			COLLECTED B'	Y: DE HA	Laverds	<b>-</b> 51	
SAMPLE DESCRIPTION/LOCATION	Date	Time	Sample Matrix <sup>1</sup>	Sample Ty <del>pe<sup>2</sup></del>	No. of Containers	ANALYSIS REQUESTED'	Sample Preservation
WI-COMP	417/2	/750	waste/soil	COMP.	1	*	cool
+ JUSTE DIGELLA POF	lund	e Ri	chulas	Roux Asso.	cours In	. i-800-9	57-7689
'							

<sup>3</sup> VOC - USEPA 8260, 8270, 6010 <sup>2</sup>Type = grab, composite Frank = Ground water, surface water, sediment, biota Relinquished by: Received by:\_\_\_\_ Date Time Date Time Date Relinquished by: Time Received by: Date Time of: Relinquished by: Date Received by:\_\_\_\_ Time Use this space if shipped via courier (e.g., Fed Ex)
Relinquished by: Courier Name and Airbill Number: Time Date Time J'Sira +Gere 1900 1900 \*Attach delivery/courier receipt to Chain of Custody Date Received by:\_\_\_ Relinquished by: Time

1	recex. USA Airbill	\$ 8187 0377 9288
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	Sender's DE Haverdink	Phone (314) 842-4550
	Company O'BRIEN & GERE	
	Address 12250 WEBER HILL RD	Dept.Floor/Sulafforms
	CAY SAINT LOUIS	State MD 21P 63127
2	Your Internal Billing Reference 23548.	080"1"80/
3	To Recipion's Bill Waltrip	Phone ( )
	company Safety Kleen	
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See back for application instructions.

Questions? Call 1-800-Go-FedEx\* (800-463-3339) Violt our Web alto at www.fedex.com

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Savannah Laboratories division of Seven Trent Unboratories, Inc.

## ANALYSIS REQUEST AND CHAIN OF CUSTODY RECO

5102 LaRoche Avenue, Savannah, GA 31404 Phone: (912) 354-7858 / 112) 352-0165
2846 Industrial Plaza Drive, Tallahassee, FL 32301 Phone: (850) 878-3994 Fun. (850) 878-9504
900 Lakeside Drive, Mobile, AL 36693 Phone: (334) 666-6633 Fax: (334) 666-8696
6712 Benjamin Rd., Sulte 100, Tampa, FL 33834 Phone: (813) 885-7427 Fax: (813) 885-7049

a division of Severn Tr	ent Laboratories, Inc.										0	6712 Be	mjamin f	Rd., Suite	100, Tai	mpa, FL	33634		Phone:	(813) 885-7427	Fax:	(813) 885-7049
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# ANALYSIS REQUEST AND CHAIN OF CUSTODY RECO.

5102 LaRoche Avenue, Savannah, GA 31404 Phone: (912) 354-7858 1 12) 352-0165
2846 Industrial Plaza Drive, Tallahassee, FL 32301 Phone: (850) 878-3994 Fax: (850) 878-9504
900 Lakeside Drive, Mobile, AL 36693 Phone: (334) 666-6633 Fax: (334) 666-6696
6712 Benjamin Rd., Sulte 100. Tampa, FL 33634 Phone: (813) 885-7427 Fax: (813) 885-7049

Savannah Laboratories adreson of Streen Treet Caboratores, Inc.										900 Lakeside Drive, Mobile, AL 36693 6712 Benjamin Rd., Sulte 100, Tampe, FL 33634								Phone: (334) 666-6633 Fax: (334) 666-869 Phone: (813) 885-7427 Fax: (813) 885-704			
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Date 4 -25-00

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Received for Laborato	iry By/Signatur	re	Date/Time Send Samples to: Triangle Laboratories, Inc. Attn: Sample Custodian 801 Capitola Drive Durham, NC 27713 USA Phone: (919) 544-5729 • Fax: (919) 544-5491									

Directions:

- (1) Provide and/or correct client and project information.(2) Verify analysis, check approriate boxes for each sample.
- (3) Enter the sample ID to be used when reporting the samples.(4) Please indicate the preservation used for each sample.

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# ANALYSIS REQUEST AND CHAIN OF CUSTODY RECC

5102 LaRoche Avenue, Savannah, GA 31404 Phone: (912) 354-7858 J12) 352-0165
2846 Industrial Plaza Drive, Taliahassee, FL 32301 Phone: (850) 878-3994 Fax: (850) 878-9504
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6712 Benjamin Rd. Suite 100, Tampa FL 33634 Phone: (813) 885-7427 Fax: (813) 885-7427

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(1) Provide and/or correct client and project information.

(2) Verify analysis, check approriate boxes for each sample.

(3) Enter the sample ID to be used when reporting the samples.

(4) Please indicate the preservation used for each sample.

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Matrix = Ground water, surface water, sediment, biota	¹ voc	- USEPA 8	3260, 8270, 6010 - Type = grap composite		
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#### 3.24 Overview of Ecological Assessment Field Sampling

The Ecological Field Assessment consisted of two separate sampling events: a Reconnaissance Survey that occurred on September 20 through 22, 1999 and the Main Sampling Event that occurred on October 4 to 9 and November 1 to 3, 1999. The Reconnaissance Survey provided information to identify reference areas and biota types for sampling. During the Main Sampling Event, which occurred at the same time as surface water and sediment sampling for chemical analysis, sediment samples were collected for toxicity bioassays. Biota samples collected during the main sampling event, including fish, invertebrates, benthic organisms, and vegetation, were analyzed for chemicals of concern (target analytes). Analyses of chemicals in fish fillets will also be used in the Human Health Risk Assessment to evaluate human exposure due to ingestion.

#### 3.25 Ecological Reconnaissance Survey

#### 3.25.1 Rationale/Design

The goals of the reconnaissance survey were to:

- a) select ecological sampling stations in Dead Creek, the Borrow Pit, and reference areas
- b) evaluate fish sampling methods and species for tissue analysis
- c) evaluate invertebrate sampling methods and species for tissue analysis
- d) evaluate crayfish sampling methods for tissue analysis
- e) evaluate plant sampling methods and species for tissue analysis.

#### 3.25.2 QA/QC Procedures

There were no QA/QC procedures required or employed during the ecological reconnaissance survey

#### 3.25.3 Field Procedures

Prior to beginning the survey, a preparatory inspection meeting was held that was attended by a representative of each of the interested parties (Section 3.25.4).

The primary purpose for the survey was to select stations for the collection of surficial sediments, biological samples, and toxicity testing. The following criteria were applied in selecting sampling locations in Dead Creek sectors B, C, D, E, and F:

- a) spatial coverage by locating stations near the upstream end of the sector, near the middle, and near the downstream end (three locations);
- b) presence of depositional sediments as indicated by mud and/or fine sand;
- c) presence of at least a few inches of water in order to insure that aquatic invertebrate life can exist.

The following criteria were applied in selecting sampling locations in the Borrow Pit:

- a) spatial coverage by locating stations north of where Dead Creek enters the Borrow Pit, near the mouth of Dead Creek, and south of where Dead Creek enters the Borrow Pit.
- b) presence of depositional sediments as indicated by mud and/or fine sand;
- c) presence of at least a few inches of water to insure that aquatic invertebrate life can exist.

The following criteria were applied for the selection of reference areas:

- a) physical similarity to Dead Creek or the Borrow Pit
- b) location away from direct influence of industrial discharges, including major highways

The survey was carried out over a three-day period (September 20-22, 1999). Sample locations were identified by line of sight and were flagged with labeled tape. Habitat Assessment Field Data Sheets were filled out for each creek sector, the Borrow Pit, and the reference areas (Section 3.25.4). On September 21

and 22, Mike Ondrachek, an employee of Weston who served as representative for the US Environmental Protection Agency, joined the survey. The selection of sampling stations was discussed with Mr. Ondrachek throughout the effort.

As called for in the workplan, a total of 23 sampling stations were designated in Dead Creek, Site M, the Borrow Pit, and two reference areas for sediment triad analysis (chemistry, benthic invertebrate community, and sediment toxicity). Dead Creek was divided into five sectors, B, C, D, E, and F. Each Creek Sector contained three sampling stations, according to the above criteria, for a total of 15 sampling stations in Dead Creek. Site M, a flooded borrow connected to creek sector B, contained a single sampling station. The Borrow Pit contained three sampling stations.

Two reference areas were selected during the reconnaissance survey. Reference area 1 was a section of Old Prairie du Pont Creek near the town of East Carondelet, approximately 3 miles southwest of the end of Dead Creek in the Borrow Pit. This section of Old Prairie du Pont Creek is a broad shallow water body with a mud substrate similar to the Borrow Pit. It is distant from any influence from the site or other industrial areas, but is similar to the Borrow Pit in that it is near agricultural land. Two sampling locations were selected in reference area 1. These are depicted on Figure 3.25.3.1. It was not possible to obtain permission to sample the second reference area selected during the reconnaissance survey. Instead, two bodies of water in Monroe County, collectively referred to as reference area 2, were selected during the main sampling event. (The deviation log for this change is in Section 3.25.4). These water bodies were approximately 20 miles south of Dead Creek. These two water bodies contained one sampling station each. Reference area 2-1 was in Long Slash Creek north of the culvert where Merrimac Road crosses the creek. This section was similar to Dead Creek sectors B through E in that it was shallow and muddy. Reference area 2-2 was a flooded borrow pit north of Fountain Creek. These reference areas are shown on Figure 3.25.3.2.

The second part of the survey was to observe and select the biota present for tissue analysis and determine methods of biota sampling. For invertebrates for tissue analysis, snails were selected because they were abundant in most of the creek sections and would provide sufficient tissue for chemical analysis. Clams were observed in the Borrow Pit and were selected for analysis from that area. Both these organisms could be collected by hand from the sediment surface.

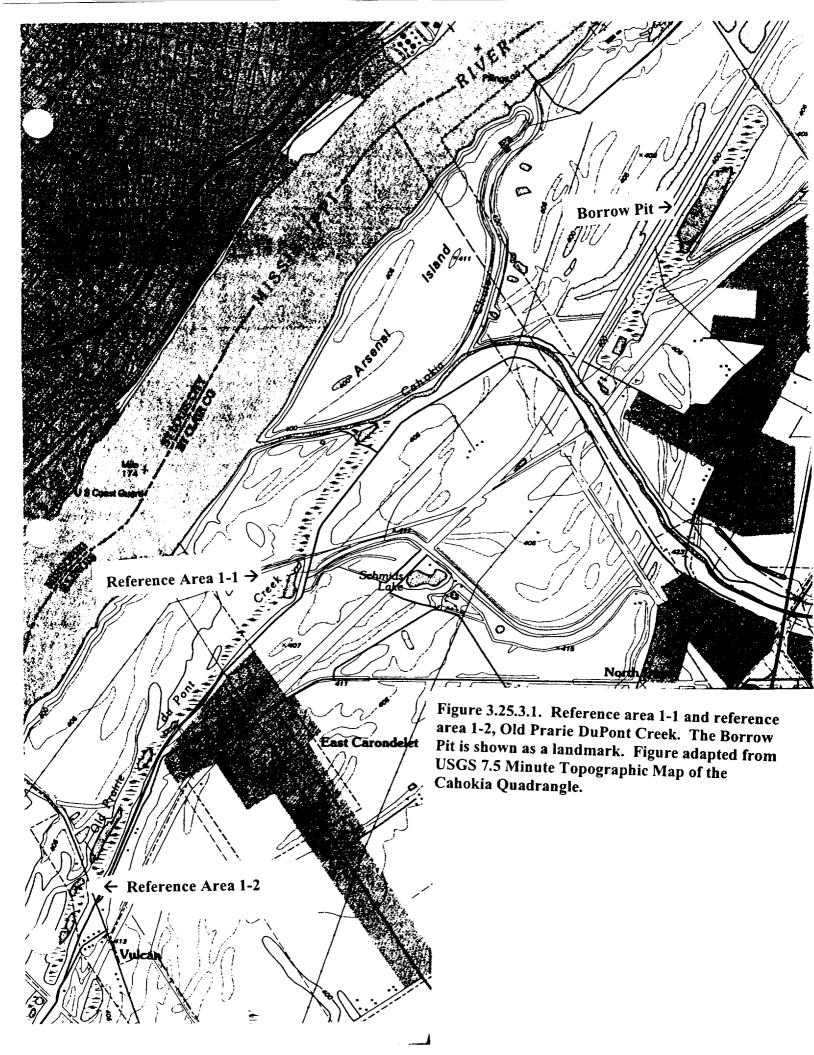
A baited minnow trap was deployed overnight in the Borrow Pit during the reconnaissance to evaluate the presence of crayfish for sampling. None were caught in the trap. It was decided to employ both minnow traps and beach seines to collect this species during the main sampling event.

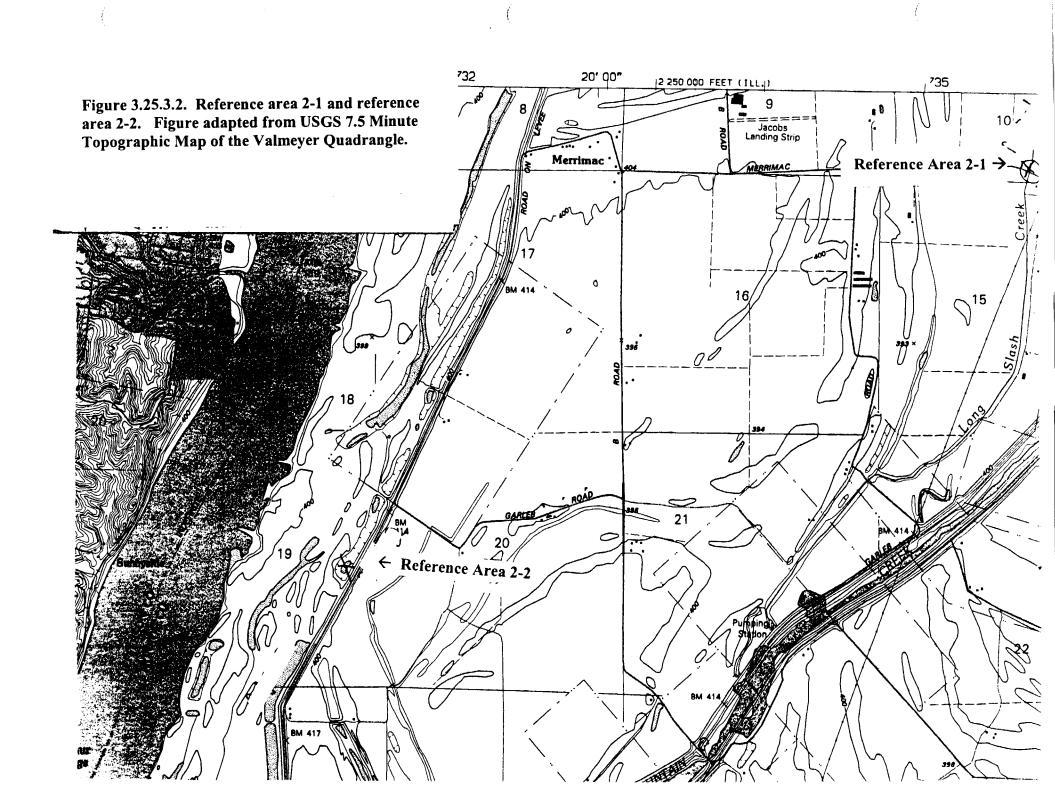
Fish were observed in most creek sectors and the Borrow Pit. Because of the shallow water present, beach seining was selected as the primary fish collection method. Catfish traps, minnow traps, and gill nets were also identified as fish collection methods.

The vegetation observed growing on the sediment surface in most creek sections was creeping buttercup (Ranunculus reptans). Emergent species such as cattails were only observed in one creek section. Therefore, creeping buttercup was selected as the vegetation species for analysis. These plants could be collected by hand.

#### 3.25.4 Documentation

The preparatory meeting inspection form for this task is in Section 3.25.4.1. The Habitat Assessment Field Data Sheets are in section 3.25.4.2. The deviation log for the change in reference area is in Section 3.25.4.3. Photographs are in Section 3.25.4.4. Section 3.25.4.5 contains the Daily Work Logs, Work Forecasts, and Safety Meeting Forms from the Reconnaissance Survey. Section 3.25.4.5 contains field notes from the Reconnaissance Survey.





3.25.4.1 Preparatory Meeting Inspection Form

678B

### PREPARATORY INSPECTION MEETING

Project Name: Schuta Schget Ar	ea / Task: Recon Survey (Eccly, r.l.
	7
1. Scheduled Work:	
2. Equipment, Procedures, Personnel:	
3. Ref. To App. Sec. of FSP/HASP:	
4. Issues that could arise and how to resolve:	
5. Solutia comments:	
6. EPA comments:	
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Reference locations for	triad sampling
B. Scleet plant speci	es for tissue analysis
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C. Collect and qualit	abively examine seliments
for inverte brates	V
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E. Determine if fish	cre present in
creek segments	
D-Net, GPS, Personnel From Mer	neie - Cura (Menere/Togertz) GPA/Win
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Eik Kengel Gul King	RFW
John Fiore St	Maverick
Charles Menzie	Menzie - Cura
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RECORD ON REVERSE SIDE	PRINTED NAME: SIGNATURE OF PREPARE
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#### 3.25.4.2 Habitat Assessment Field Data Sheets

STREAM NAME: Dead	Creek	LOCATION Section B						
STATION#	RIVERMILE:	STREAM CLASS						
LAT:	LONG:	RIVER BASIN Mississippi						
STORET#		AGENCY Menzie-Cura & Associates, Inc.						
INVESTIGATORS C. M	enzie, K. Fogarty							
FORM COMPLETED BY	f: K. Fogarty, C. Menzie	DATE: 10/4/99 AM PM	REASON FOR SURVEY Remedial Investigation					

Habitat		CATE	GORY						
Parameter	Optimal	Sub-optimal	Marginal	Poor					
1. Epifaunal Substrate/ Available Cove	Greater than 50% of substrate favorable for epifaunal colonization and fish cover, mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient)	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale.	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.					
SCORE	20 19 18 17 16	15 14 13 12 (11)	10 9 8 7 6	5 4 3 2 1 0					
2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent: root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present	All mud or clay or sand bottom; little or no root mat; no submerged vegetation	Hard-pan clay or bedrock no root mat or vegetation					
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0					

	Habitat		CATE	GORY							
	Parameter	Optimal	Sub-optimal	Marginal	Poor						
3.	Pool Variability	Even mix of large- shallow, large-deep, small-shallow, small- deep pools present	Majority of pools large- deep; very few shallow	Shallow pools much more prevalent than deep pools	Majority of pools small- shallow or pools absent						
sc	ORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0						
4.	Channel Alteration	Channelization of dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e. dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely						
sc	ORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0						
5.	Sediment Deposition	Little or no enlargement of islands or point bars and less than 5%<20% for low-gradient streams) of the bottom affected by sediment deposition.	bar formation, mostly from gravel, sand or fine sediment on old and new bars; 30-50% (50-80%) for low-gradient streams)								
sc	ORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0						
6.	Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line, (Note – channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.	The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.						
SC	ORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0						
7.	Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.						
SC	ORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 (4) 3 2 1 0						

Habitat	CATEGORY																							
Parameter		(	Optir	nal			S	ub-ol	otima	i		М	argir	nai				Po	or		_			
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SCORE left (lds.)	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0			
9. Bank Stability (score each bank)	of erd abse poter	osior Int or Intial Iems	n or t r min for, f	evide pank f imal; I uture % of b	ailure little	infr ero ove rea	eque sion i er. 5-3	mostl		k in	Mode 30-60 reach erosi poter	0% o n has on; h	if bar s area sigh e	ık in as of erosio	n	free second	stableas; "quentions vious -100%	raw" t alor and banl 6 of t	areang st ben k slo bank	is raigh ds; ughii	nt ng;			
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SCORE left (lds.)	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0			

Total	Score	116

STREAM NAME:	Dead Creek	LOCATION Section C	
STATION#	RIVERMILE:	STREAM CLASS	
LAT:	LONG:	RIVER BASIN Mississippi	
STORET#		AGENCY Menzie-Cura & Associates, Inc.	_
INVESTIGATORS	C. Menzie, K. Fogarty		
FORM COMPLET	ED BY: K. Fogarty, C. Menzie	DATE: 10/4/99  AM PM  REASON FOR SURVEY Remedial Investigation	

Habitat		CATE	GORY							
Parameter	Optimal	Sub-optimal	Marginal	Poor						
1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover, mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient)	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale.	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.						
SCORE	20 19 18 17 16	15 14 13 12 (11)	10 9 8 7 6	5 4 3 2 1 0						
2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent: root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present	All mud or clay or sand bottom; little or no root mat; no submerged vegetation	Hard-pan clay or bedrock no root mat or vegetation						
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0						

	Habitat				<b></b>					CATE	GORY					~						
	Parameter	Optimal  Even mix of large- shallow, large-deep, small-shallow, small- deep pools present					Sub-optimal						argi	nal		Poor						
3. P	ool Variability						Majority of pools large- deep; very few shallow					Shallow pools much more prevalent than deep pools						Majority of pools small- shallow or pools absent				
SCOR	RE	20 19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
	hannel Iteration	Channelization of dredging absent or minimal; stream with normal pattern.			pres	ent, uidge ence ineliz ging, 20 yi ent, t	usua abut of pa ation (great) mout ro	tmen ast n, i.e. eater aay be ecen	areas ts; than	exterest emb	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.					Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely						
SCOR	RE	20 19	18	17	16	15)	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
	ediment eposition	Little or no enlargement of islands or point bars and less than 5%<20% for low-gradient streams) of the bottom affected by sediment deposition.  Some new increase is bar formation, mostly from gravel, sand or sediment: 5-30% (20-50% for log gradient) of the bottom affected; slight depositin pools			itly or fine r low- ttom	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50- 80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.					development; more than 50% (80% for low-					ar ian m						
SCOR	RE	20 19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	①	0	
	hannel inuosity	The bendincrease length 3 longer the straight I channel consider coastal plow-lying parameter rated in the straight of the str	the strain to 4 tine (No braiding ed nor olains a gareas er is no to 4 tine et a gareas er is no to 4 tine et a gareas er is no to 4 tine et a gareas er is no to 4 tine et a gareas er is no to 4 tine et a gareas er is no to 4 tine et a gareas er is no to 4 tine et a gareas er is no to 4 tine et a gareas er is no tine et a gareas er is no tine et a gareas er is no tine et a gareas er is no tine et a gareas er is no tine et a gareas er is no tine et a gareas er is no tine et a gareas er is no tine et a garage et a gareas er is no tine et a garage et a ga	ream nes was ote - g is mal in and or . This ot eas	in a n ther s sily	incre lengt	ase t	the s o 3 ti	trear imes	tream n longer traight	strea strea time	am lei s long	creasingth	the se the 2 to 1 nan if ht line	it	wat cha	erwa	stra ly has zed t	s be	en		
SCOR	 RE	20 19	18	17	16	15	14	13	12	11	10	9	8	7	6	(5)	4	3	2	1	0	
	hannel Flow tatus	Water re both low minimal channel exposed	er banl amoun substra	ks, ar t of	nd	available channel <25% of channel		available channel; or <25% of channel		Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.					Very little water in channel and mostly present as standing pools.							
SCOR	E	20 19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	

Habitat		CATE	GORY										
Parameter	Optimal	Sub-optimal	Marginal	Poor									
8. Bank Vegetative Protection (score each bank)  Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces covered by native vegetation, including trees. Understory shrubs, or nonwoody macrophtes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70 – 90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in									
SCORE right (Ids.)	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0									
SCORE left (lds.)	20 19 18 17 16	15 14 (13) 12 11	10 9 8 7 6	5 4 3 2 1 0									
9. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for, future problems. <5% of bank affected	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.									
SCORE right (Ids.)	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0									
SCORE left (lds.)	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0									
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear- cuts, lawns, or crops) have not impacted zone.	Widths of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zones 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities									
SCORE right (Ids.)	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0									
SCORE left (lds.)	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0									

Total Score 104

STREAM NAME: Dead	d Creek	LOCATION Section D						
STATION#	RIVERMILE:	STREAM CLASS						
LAT:	LONG:	RIVER BASIN Mississippi						
STORET#		AGENCY Menzie-Cura & Associates, Inc.						
INVESTIGATORS C.	Menzie, K. Fogarty							
FORM COMPLETED B	Y: K. Fogarty, C. Menzie	DATE: 10/4/99 AM PM	REASON FOR SURVEY Remedial Investigation					

	Habitat		CATE	GORY						
Parameter		Optimal	Sub-optimal	Marginal	Poor					
1. Epifaunal Substrate/ Available Cover		Greater than 50% of substrate favorable for epifaunal colonization and fish cover, mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient)	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale.	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.					
sc	ORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0					
	Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent: root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present	All mud or clay or sand bottom; little or no root mat; no submerged vegetation	Hard-pan clay or bedrock no root mat or vegetation					
SC	ORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0					

Habitat		CATE								
Parameter	Optimal	Sub-optimal	Marginal	Poor						
3. Pool Variability	Even mix of large- shallow, large-deep, small-shallow, small- deep pools present	Majority of pools large- deep; very few shallow	Shallow pools much more prevalent than deep pools	Majority of pools small- shallow or pools absent						
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0						
4. Channel Alteration	Channelization of dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e. dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely						
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0						
5. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5%<20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment: 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50- 80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition						
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0						
6. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note – channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.	The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.						
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0						
7. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.						
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 (1) 0						

Habitat										CATE	GORY													
Parameter			Optir	nal			S	np-ot	otima	ı <b>l</b>		M	largi	nal				Po	or					
8. Bank Vegetative Protection (score each bank)  Note: determine left or right side by facing downstream.	stre cov veg tree shri mad disr graz min alm	eambarered letation letation les. Ur lubs, of croph ruption zing of imal	ank s by na on, in nders or no ntes; v n thre or no or no	cludir tory nwood vegeta ough wing t evid nts all	streambank surfaces covered by native vegetation, but one class of plants is not well- represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.						strea cove disru patci close vege less pote	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.						Less than 50% of the streambank surfaces covered by vegetation; disruption of streamban vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble heights						
SCORE right (lds.)	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0			
SCORE left (lds.)	20	19	18	17	16	15	14	13	12	11	(10)	9	8	7	6	5	4	3	2	1	0			
(score each bank)	abs pote prol	ent o ential	r min for, f	oank imal; uture % of t		ero: ove rea	sion i r. 5-3	nosti 30% d	nall ai y hea of ban as of	ık in	reac	h ha: ion; l	s are	nk in eas of erosic ng floc		free sec obv	eas; " quen ctions rious 100% siona	t alor s and bank 6 of t	ng st ben k slo bank	raigh ds; ughii				
SCORE_right_(lds.)	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0			
SCORE left (lds.)	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0			
10. Riparian Vegetative Zone Width (score each bank riparian zone)	>18 activitots, cuts	mete vities , roac s, law	ers; h (i.e., dbeds ns, o	an zo umar parki s, clea r crop icted	ng ng ar-	12- acti	18 m vities	eters; have	rian z hum impa imally	an acted	6-12	meto ities	ers; l have	ian zo humar impa deal.	1	<6 ripa	dth of mete arian numa	rs; lit vege	tle o	r no n du				
SCORE right (Ids.)	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0			
SCORE left (lds.)	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	(5)	4	3	2	4	0			

Total	Score	101	

STREAM NAME:	Dead Creek	LOCATION Section E							
STATION#	RIVERMILE:	STREAM CLASS							
LAT:	LONG:	RIVER BASIN Mississipp							
STORET#		AGENCY Menzie-Cura &	Associates, Inc.						
INVESTIGATORS	C. Menzie, K. Fogarty								
FORM COMPLET	ED BY: K. Fogarty, C. Menzie	DATE: 10/4/99 AM PM	REASON FOR SURVEY Remedial Investigation						

Habitat	CATEGORY											
Parameter	Optimal	Sub-optimal	Marginal	Poor								
Epifaunal     Substrate/     Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover, mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient)	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale.	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.								
SCORE	20 19 18 17 16	15 14 13 12 (11)	10 9 8 7 6	5 4 3 2 1 0								
2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent: root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present	All mud or clay or sand bottom; little or no root mat; no submerged vegetation	Hard-pan clay or bedrock no root mat or vegetation								
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0								

	Habitat										CATE	GORY	·									
	Parameter		(	Optir	nal			Sı	np-o	ptima	al		N	largi	nal				Po	ог		
3. P	ool Variability	shall sma	low, II-sha	large allow	arge- -deep , sma esent	(I-				ols la w sha		mor		vale	muc nt tha						sma abse	
SCOR	RE	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0 (
	hannel Iteration	dred mini	lging mal;		ent or am wit		pres of bi evid char dred past pres	ent, ridge ence nneli lging 20 y ent, nneli	usua abu of p zatio , (gre /r.) m	tmen ast n, i.e.	areas ts; than	exterest emb	nsive ankn ring s	e; nents truct on bo 80% each eed a	ures th ba 6 of		gat 80% cha disi	oion % of anne rupte oitat	the s lized ed. In	mer trea and stre	nt; ov im re: i am Itered	ach
SCOR	ξ <b>Ε</b>	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
	ediment eposition	of isl and for lo	lands less ow-gr e bot	s or p than radie ttom		ars 20% eams) ed by	from sedi 5-30 grad	formation of the format	ation vel, s t: 20-50 of th	% fo	stly or fine r low-	new sedi new 80% the l sedi obst cons bend	grav ment bars for le cottor ment ruction striction ds; m	el, sa on o ; 30- ow-g m aff depons, ons, oder n of p		r fine d 50- nt) of ;	mar dev 50% gra cha poo to s	teria relop 6 (80 dien ingin	I, incoment 0% for t) of the imost tantia	reas t; me or loo the t que abs	ottor	ar nan m
SCOR	E	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
	hannel inuosity	incre lengt longe straig chan cons coas low-l	ease th 3 th ght li nel th idere tal p ying mete	the s to 4 ti an if i ne, (I oraidi ed no lains area er is r	the stitream imes it was Note - ing is and c and c s. Thi not ea areas	in a - in: other s: sily	incre leng	ease th 2	the s to 3 t	trear imes	tream n longer traight	strea strea time	am le s lon	crea: ngth ger tl	the se the 2 to nan if tht lin	it	wat cha	erwa		s be		)
SCOR	E	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	(5)	4	3	2	1	0
	hannel Flow tatus	both minir	lowe nal a nel s	er bar amou subst	s base nks, a nt of rate is	nd	avail	able % of	char chan	5% o nnel; nel xpose	or	the a	availa or riff	ble d le su	75% d chann bstra cosed	el, tes	cha	nnel sent	e wa and as st	mos	stly	
SCOR	E	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

Habitat										CATE	GORY										
Parameter Parameter			Optin	nal			Sı	np-ot	otima	1		M	argir	al				Po	or		
8. Bank Vegetative Protection (score each bank)  Note: determine left or right side by facing downstream.	stre cov veg tree shru mad disr graz min alm	streambank surfaces covered by native vegetation, including trees. Understory shrubs, or nonwoody macrophtes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.			stree cov veg of p rep evid full to a that pot	eamb rered retation plants dent to plant any grone ential	by nation, but is not not on ted; out not grow reat each all	urface ative ut one of well disrup of affe the of the t stub	class btion ecting tential more	50-7 strea cove disru patci close vege less potei heigh	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble heights.										
SCORE right (Ids.)	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	(5)	4	3	2	1	0
SCORE left (Ids.)	20	19	18	17	16	15	14	13	12	11	(10)	9	8	7	6	5	4	3	2	1	0
9. Bank Stability (score each bank)	of e abs pote prot	rosio ent o ential	table; on or the or minion for, for s. <5%	oank imal; uture	failure little	infre eros ove rea	eque sion i er. 5-3	nostl		k in	30-6	0% on has		k in is of rosio	n	are fred sec obv 60-	as; "i juent tions ious 100%	raw" alor and banl	area ng st ben k slo pank	raigh	it ng;
SCORE right (Ids.)	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
SCORE left (Ids.)	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	>18 activ lots, cuts	mete vities , road s, law	ripari ers; h (i.e., dbeds ns, oi impa	umar park i, clea r crop	n ing ar-	12- acti	18 m vities	eters; have	rian z hum impa imally	an acted	Widtl 6-12 activi zone	mete ities l	ers; h have	umar impa	1	<6 ı ripa	mete rian	rs; lit	tle c	n du	
SCORE right (Ids.)	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
SCORE left (lds.)	20	19	19	17	16	15	14	13	12	44	10	9	8	7	6	5	4	3	2	1	0

Total Score 98

STREAM NAME:	Dead Creek	LOCATION Section F							
STATION#	RIVERMILE:	STREAM CLASS							
LAT:	LONG:	RIVER BASIN Mississipp	i						
STORET#	•	AGENCY Menzie-Cura &	Associates, Inc.						
INVESTIGATORS	C. Menzie, K. Fogarty								
FORM COMPLETE	ED BY: K. Fogarty, C. Menzie	DATE: 10/4/99 AM PM	REASON FOR SURVEY Remedial Investigation						

Habitat		CATEGORY														
Parameter	Optimal	Sub-optimal	Marginal	Poor												
1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover, mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient)	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale.	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.												
SCORE	20 19 18 17 (16)	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0												
2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent: root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present	All mud or clay or sand bottom; little or no root mat; no submerged vegetation	Hard-pan clay or bedrock no root mat or vegetation												
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0												

Habitat		CATE	GORY	<del></del>					
Parameter	Optimal	Sub-optimal	Marginal	Poor					
3. Pool Variability	Even mix of large- shallow, large-deep, small-shallow, small- deep pools present	Majority of pools large- deep; very few shallow	Shallow pools much more prevalent than deep pools	Majority of pools small- shallow or pools absent					
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0					
4. Channel Alteration	Channelization of dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e. dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely					
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0					
5. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5%<20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment: 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition					
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0					
6. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note — channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.	The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.					
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0					
7. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.					
SCORE	20 19 18 17 16	15 14 13 12 (11)	10 9 8 7 6	5 4 3 2 1 0					

Habitat									CATE	GORY										
Parameter		Opti	mal	_+-		S	ub-o	otima	ıl		M	argi	nal				Po	or		
8. Bank Vegetative Protection (score each bank)  Note: determine left or right side by facing downstream.	stream covere vegeta trees. I shrubs macrop disrupt grazing minima almost	More than 90% of the streambank surfaces covered by native vegetation, including trees. Understory shrubs, or nonwoody macrophtes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.			cov veg of p rep evid full to a that pote	streambank surfaces covered by native vegetation, but one class of plants is not well- represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.						oy ve of bar oppe n cor one-	urface getat ious; re soi ed mmor half c	ion; for of the	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble heights.					
SCORE right (Ids.)	20 19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
SCORE left (lds.)	20 19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
9. Bank Stability (score each bank)	Banks of eros absent potenti probler affecte	ion or i or min al for, i ns. <5	bank imal; future	failure little	infro eros ove read	eque sion i r. 5-3	nt, sn mostl 80% d	able; nall a y hea of bar as of	ık in	30-6 read eros	lerate 60% o th has tion; h ential	f bar area igh e	nk in as of erosic	ก	are fred sed obv 60-	stable eas; "i quent ctions vious 100% siona	raw" alor and bank 6 of t	area ng st ben k slo pank	s raigh ds; ughii	nt ng;
SCORE right (Ids.)	20 19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
SCORE left (lds.)	20 19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of >18 me activities lots, roacuts, la have no	eters; h es (i.e., adbeds wns, o	iuma park s, cle r cro	n ing ar- ps)	12-	18 mo	eters; have	rian z hum impa imally	an acted	6-12 activ	th of r meterities l a gr	ers; h nave	umar impa	1	<6 ripa	ith of mete irian iuma	rs; lit vege	tle o tatio	r no n du	
SCORE right (Ids.)	20 19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
SCORE left (lds.)	20 19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

Total	Score	181

STREAM NAME:	Dead Creek/Borrow Pit	LOCATION Borrow Pit
STATION #	RIVERMILE:	STREAM CLASS
LAT:	LONG:	RIVER BASIN Mississippi
STORET#		AGENCY Menzie-Cura & Associates, Inc.
INVESTIGATORS	C. Menzie, K. Fogarty	
FORM COMPLET	ED BY: K. Fogarty, C. Menzie	DATE: 10/4/99  AM PM  REASON FOR SURVEY Remedial Investigation

Habitat	CATEGORY												
Parameter	Optimal	Sub-optimal	Marginal	Poor									
Epifaunal     Substrate/     Available Cover  Large open shallow pond with mud bottom	Greater than 50% of substrate favorable for epifaunal colonization and fish cover, mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient)	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale.	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.									
SCORE	20 19 18 17 (16)	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0									
2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent: root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present	All mud or clay or sand bottom; little or no root mat; no submerged vegetation	Hard-pan clay or bedrock no root mat or vegetation									
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0									

Habitat	CATEGORY													
Parameter	Optimal	Sub-optimal	Marginal	Poor										
3. Pool Variability	Even mix of large- shallow, large-deep, small-shallow, small- deep pools present	Majority of pools large- deep; very few shallow	Shallow pools much more prevalent than deep pools	Majority of pools small- shallow or pools absent										
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0										
4. Channel Alteration  Man-made basin	Channelization of dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e. dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely										
SCORE	20 19 18 17 16	15) 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0										
5. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5%<20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment: 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50- 80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-										
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0										
6. Channel Sinuosity  Man-made basin	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note — channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.	The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.										
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0										
7. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.										
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0										

Habitat	CATEGORY													
Parameter	Optimal	Sub-optimal	Marginal	Poor										
8. Bank Vegetative Protection (score each bank)  Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces covered by native vegetation, including trees. Understory shrubs, or nonwoody macrophtes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70 – 90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble heights.										
SCORE right (Ids.)	20 19 18 17 16	15 (14) 13 12 11	10 9 8 7 6	5 4 3 2 1 0										
SCORE left (lds.)	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0										
9. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for, future problems. <5% of bank affected	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.										
SCORE right (lds.)	20 (19) 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0										
SCORE left (lds.)	20 (19) 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0										
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear- cuts, lawns, or crops) have not impacted zone.	Widths of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zones 6-12 meters; human activities have impacted zone a great deal.	n <6 meters; little or no										
SCORE right (Ids.)	20 19 18 17 16	15 14 (13) 12 11	10 9 8 7 6	5 4 3 2 1 0										
SCORE left (lds.)	20 19 (18) 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0										

Total Score /67

STREAM NAME:	Old Prairie duPont Creek (reference area 1)	LOCATION
STATION#	RIVERMILE:	STREAM CLASS
LAT:	LONG:	RIVER BASIN Mississippi
STORET#		AGENCY Menzie-cura & Associates, Inc.
INVESTIGATORS	C. Menzie, K. Fogarty	
FORM COMPLETI	ED BY: K. Fogarty, C. Menzie	DATE: 10/4/99  AM PM  REASON FOR SURVEY Remedial Investigation

Habitat	CATEGORY										
Parameter	Optimal	Sub-optimal	Marginal	Poor							
1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover, mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient)	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale.	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.							
SCORE	20 19 18 17 16	15 14 13 12 (11)	10 9 8 7 6	5 4 3 2 1 0							
2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent: root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present	All mud or clay or sand bottom; little or no root mat; no submerged vegetation	Hard-pan clay or bedrock no root mat or vegetation							
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0							

	Habitat									CATE	EGORY					<del>,</del>						
	Parameter		Optin	nal			Şι	ıb-op	tima	1		N	largi	nal_		Poor						
3. F	Pool Variability	Even m shallow small-sh deep po	, large hallow	-deep , sma	ep, deep; very few shallow hall-						e pre	pools valer			Majority of pools small- shallow or pools absent							
sco	RE	20 19	20 19 18 17 16 15 14 13 12 11				10	10 9 8 7 6						3	2	1	0					
4. (	Channel Alteration	dredgin minimal	edging absent or nimal; stream with of bormal pattern. evic chadred pas pres					Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e. dredging, (greater than past 20 yr.) may be present, but recent channelization is not					zatio e; nents struction bo o 80% each zed a	or ures th ba		Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely						
sco	RE	20 19	18	17	16	<del>                                     </del>		13	12	11)	10	9	8	7	6	5	4	3	2	1	0	
	Sediment Deposition	Little or of island and less for low-g of the be sedimen	ds or p s than gradie ottom	oint b 5%<2 nt stre affect	oars 20% eams) ted by	bar formation, mostly from gravel, sand or fine sediment: 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools  new sediment: 80% the bottom sediment obstruction obstructions bence deposition depositio						Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50- 80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.						development; more than 50% (80% for low-				
SCO	RE	20 19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
6. C	Channel Sinuosity	The ben increase length 3 longer th straight channel consider coastal low-lying parametrated in	the s to 4 to han if ine. (I braidine red no plains g area ter is r	trean imes it was Note ing is ormal and o s. Thi not ea	in a in other is isily	incre leng	ease th 2 th	the s to 3 ti	trean mes	ream 1 longer raight	strea strea times	ım ir ım le s lon	ds in the creater of	se the 2 to nan if	1 it	wat cha	erwa	stra ly ha ized	s be	en	3	
SCOF	RE	20 19	18	17	16	15	14	13	12	11	10	9	8	7	6	(5)	4	3	2	1	0	
	Channel Flow Status	Water re both low minimal channel exposed	er bar amou subst	nks, a nt of	ind	Water fills > 75% of the available channel; or <25% of channel substrate is exposed.					Wate the a and/o are r	vaila or rif	ible c fle su	hann bstra	el, tes	cha	nnel sent	e wat and as st	mos	tly		
		·				I					1				$\overline{}$						0	

Habitat										CATE	GORY	<u>,                                     </u>										
Parameter			Opti	mal			Sub-optimal					M	largii	nal		Poor						
8. Bank Vegetative Protection (score each bank)  Note: determine left or right side by facing downstream.	stree cov veg tree shri mad disr gra: min alm	eamb vered getations. Use ubs, croph ruptions zing nimal nost a	on throor mo	surfactudestory nwood vege ough owing ot evic	ces ing ody stative	70 – 90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the					stre cov disr pato clos veg less pote	70% of amba ered luption ches continued at the continued	ank so by ve of bar roppe n cor one- plant	urfac geta ious; e so ed mmoi half o stub	tion; il or n; of the	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble heights						
SCORE right (lds.)	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
SCORE left (lds.)	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
9. Bank Stability (score each bank)	of e abs pote prol	erosio ent c entia	on or or min i for, t s. <5	bank nimal future	dence : failure ; little e bank	infre ero ove rea	eque sion ( er. 5-3	ely st nt, sn mostl 30% d as are	nall a y hea of bar	reas of led lk in	30-6 read eros	derate 60% o ch has sion; h ential	of bar s area nigh e	ik in as of erosid	on	fre sec ob	eas; "quen ctions vious 100°	e; ma raw" t alor s and banl % of t al sca	area ng st ber k sto bank	as raigh ids; ughi	nt ng;	
SCORE right (lds.)	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
SCORE left (Ids.)	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
10. Riparian Vegetative Zone Width (score each bank riparian zone)	>18 active lots, cuts	mete vities , road s, law	ripar ers; h (i.e., dbeds /ns, o	numa park s, cle or cro	n king ar-	Widths of riparian zone 12-18 meters; human activities have impacted zone only minimally.				Width of riparian zones 6-12 meters; human activities have impacted zone a great deal.						n <6 meters; little or no						
SCORE right (Ids.)	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
SCORE left (lds.)	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	

Total	Score	115
lotai	SCOLE	773

	ence Stream - Long Slash Creek ence area 2-1)	LOCATION Monroe Cou	nty
STATION#	RIVERMILE:	STREAM CLASS	
LAT:	LONG:	RIVER BASIN Mississippi	
STORET#		AGENCY Menzie-cura &	Associates, Inc.
INVESTIGATORS C. M	enzie, K. Fogarty		
FORM COMPLETED BY	f: K. Fogarty, C. Menzie	DATE: 10/4/99 AM PM	REASON FOR SURVEY Remedial Investigation

	Habitat									CATE	GORY										
	Parameter		Optin	nal			Sub-optimal					М	argir	nal		Poor					
"	Epifaunal Substrate/ Available Cover	Greater substrate epifauna and fish snags, sundercuror other and at st coloniza (i.e., logs not new transient	e favo al colo cover ubme t bank stable tage to tion po s/snag fall ar	orable nizat r, mix erged (s, co e hab o allo otent gs tha	e for tion c of l logs, obble bitat ow full tial at are	hab cold ade mai pop add form yet cold	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale.  10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.						Less than 10% stable habitat; lack of habitat obvious; substrate unstable or lacking.								
sco	RE	20 19	18	17	16	15	14	13	12	(11)	10	9	8	7	6	5	4	3	2	1	0
	ool Substrate haracterization	Mixture of materials and firm root mats submerg common	s, with sand s and led ve	grav prev	vel ralent:	be o	d, or domin s and	clay; nant; d sub	t san mud some merg	may root ed	botto mat;	m; li	r clay ttle oi ubme n	r no r	oot	Hard bedro vege	ock n	no ro		at o	r
scol	RE	20 19	18	17	16	15	14	13	12	11	10	9	8	7	6	5 4	. 3	3	2	1	0

Habitat	CATEGORY  Ontime! Sub-antime! Marginal Poor														
Parameter	Optimal	Sub-optimal	Marginal	Majority of pools small- shallow or pools absent											
3. Pool Variability	Even mix of large- shallow, large-deep, small-shallow, small- deep pools present	Majority of pools large- deep; very few shallow	Shallow pools much more prevalent than deep pools												
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0											
4. Channel Alteration	Channelization of dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e. dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely											
SCORE	20 19 18 17 16	15 14 (13) 12 11	10 9 8 7 6	5 4 3 2 1 0											
5. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5%<20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment: 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sedime deposition											
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0											
6. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note – channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.	The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.											
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 (3) 2 1 0											
7. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.											
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	(5) 4 3 2 1 0											

Habitat									-	CATE	GORY	,									
Parameter	Optimal			Sub-optimal						Marginal					Poor						
8. Bank Vegetative Protection (score each bank)  Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces covered by native vegetation, including trees. Understory shrubs, or nonwoody macrophtes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.				70 – 90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.					50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.					Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble heights.						
SCORE_right (Ids.)	20	19	18	17	16	15	14	13	12	11	10	9	8	7	<b>6</b>	5	4	3	2	1	0
SCORE left (lds.)	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
9. Bank Stability (score each bank)	of en abse pote prob	rosio ent o ential	stable; evidence ion or bank failure or minimal; little al for, future ns. <5% of bank d			Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.					Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.					Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.					
SCORE_right (Ids.)	20	19	18	17	16)	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
SCORE left (lds.)	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	>18 activ lots, cuts	mete rities road , lawi	ers; h (i.e., lbeds ns, o	ian zo umai park s, clea r crop acted	n ing ar-	12-	Widths of riparian zone 12-18 meters; human activities have impacted zone only minimally.			Width of riparian zones 6-12 meters; human activities have impacted zone a great deal.					Width of riparian zone <6 meters; little or no riparian vegetation due to human activities						
SCORE right (lds.)	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
SCORE left (lds.)	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

Total Score 92

STREAM NAME:	Reference Pond (reference area 2-2)	LOCATION Monroe County								
STATION#	RIVERMILE:	STREAM CLASS								
LAT:	LONG:	RIVER BASIN Mississippi								
STORET#		AGENCY Menzie-Cura & Associates, Inc.								
INVESTIGATORS	C. Menzie, K. Fogarty									
FORM COMPLETI	ED BY: K. Fogarty, C. Menzie	DATE: 10/4/99  AM PM  REASON FOR SURVEY Remedial Investigation								

Habitat		CATEC	GORY						
Parameter	Optimal	Sub-optimal	Marginal	Poor					
Epifaunal     Substrate/     Available Cover  Farm Pond	Greater than 50% of substrate favorable for epifaunal colonization and fish cover, mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient)	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale.	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.					
SCORE	20 19 18 17 16	15 14 (13) 12 11	10 9 8 7 6	5 4 3 2 1 0					
2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent: root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present	All mud or clay or sand bottom; little or no root mat; no submerged vegetation	Hard-pan clay or bedrock no root mat or vegetation					
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0					

Habitat	CATEGORY													
Parameter	Optimal	Sub-optimal	Marginal	Poor  Majority of pools small-shallow or pools absent										
3. Pool Variability	Even mix of large- shallow, large-deep, small-shallow, small- deep pools present	Majority of pools large- deep; very few shallow	Shallow pools much more prevalent than deep pools											
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0										
4. Channel Alteration  Man-made basin	Channelization of dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e. dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely										
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0										
5. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5%<20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment: 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition										
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0										
6. Channel Sinuosity  Man-made basin	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note – channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.	The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.											
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0										
7. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.										
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0										

Habitat										CATE	GORY	1									
Parameter		Optimal				Sub-optimal				Marginal						Poor					
8. Bank Vegetative Protection (score each bank)  Note: determine left or right side by facing downstream.  Rt=west side Left=east side	stre cov veg tree shru mad disr graz min alm	eamb ered etati es. U ubs, cropl ruptic zing imal ost a	on throng or mo	surface ative accludi story anwood vege vough owing of evidents a	streambank surfaces covered by native ng vegetation, but one class of plants is not well- represented; disruption tative evident but not affecting full plant growth potential to any great extent; more				50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.					str co dis ve ve rei ce	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble heights.						
SCORE right (Ids.)	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
SCORE left (lds.)	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
9. Bank Stability (score each bank)	of e abs pote prot	erosio ent o entia	on or or min I for, t s. <5	bank nimal future	lence failure ; little e bank	infr ero ove rea	derat equer sion r er. 5-3 ch ha sion.	nt, sn mostl 30% d	nall a y hea of bar	reas of aled ak in	30-6 read	60% ch ha sion;	ely un of bar is area high e durin	ık in as of erosi	on	fre se ob 60	eas; equer ction viou: -100	ole; m "raw" nt alo ns and s bar ow of nal so	area ng si d ber ik slo bani	as traig nds; nugh	ht ing;
SCORE right (Ids.)	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
SCORE <u>left</u> (lds.)	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	>18 active lots, cuts	met vities , roa s, lav	ripar ers; h s (i.e., dbeds vns, o t impa	numa , park s, cle or cro	n king ear-	12-18 meters; human activities have impacted zone only minimally.  6-12 activities have impacted zone				Width of riparian zones 6-12 meters; human activities have impacted zone a great deal.					<6 meters; little or no						
SCORE right (lds.)	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
SCORE <u>left</u> (lds.)	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

Total	Score	115	
1000	000.0	//3	

#### 3.25.4.3 Deviation Log

# DEVIATION LOG

INDIVIDUAL REQUESTING DEVIATION / COMPANY C. Menzic - Cuva DATE 10/8/99
HEALTH & SAFETY APPROVAL REQUIRED: YES: NO:
PROJECT NAME Solution Souget New I PROJECT LOCATION Dead Creek/Ref Aren
WEATHER cloudy PRECIPITATION Some TEMPERATURE 70
NUMBER OF HOURS WORKED & NUMBER OF EMPLOYEES 7
1. CONTRACT ITEM BEING WORKED ON: 2. ITEM BEING DEVIATED (REF. APPROP. SEC. OF FSP/HASP): 3. REASON FOR DEVIATION: 4. DEVIATION OR FIELD CHANGE TO BE IMPLEMENTED: 5. EQUIPMENT: 6. DEVELOPMENTS WHICH MIGHT LEAD TO ISSUANCES OF A CHANGE ORDER OR BE THE BASIS OF A CLAIM (EQUIPMENT; TIME; MANPOWER; ETC.): 7. REMARKS:
1. scapling seliment, water, biota in reference
areas
2. location end number" of reference areas
Von OP
3. We did not receive access to the pre-selected
reference even; we then looked for a substitute;
we had also found that the Old Previe Du Pont
Creck ref area lacked some characteristics we wanted
for motching with Dend Creek; as a result we
divided the second in terence area" into two
distinct locations: a creek location more similar
to Dead Creek (sneits + plents present) end a
pond location more similar to the Borrow Pit
Late (claus + large fish)
4. Collect one set of semples at each of the two locations - designate them as Ref 12-1 + Ref 2-2
PRINTED NAME / SIGNATURE OF PREPARER PRINTED NAME / SIGNATURE OF SOLUTIA REP / DATE
DATE PRINTED NAME / SIGNATURE OF USEPA REP / DATE
IF ADDITIONAL ODAGE IS SECURDED.
C (Sauger, OBG Forms, DEVLOG WPD)  C (Sauger, OBG Forms, DEVLOG WPD)

#### 3.25.4.4 Photographs

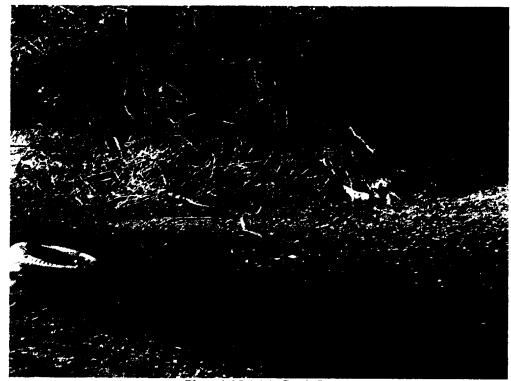


Photo 3.25.4.4.1 Creek Sector B



Photo 3.25.4.4.2 Creek Sector C showing vegetation.



Photo 3.25.4.4.3 Creek Sector F showing dense vegetation.

3.25.4.5 Daily Work Logs, Work Forecasts, Safety Meeting Forms, Field Notes

#### DAILY WORK LOG

PROJECT NAME Solution Souget Area   PROJECT LOCATION Dead (veek)  WEATHER OVERCEST PRECIPITATION NOTE TEMPERATURE TO NUMBER OF HOURS WORKED NUMBER OF EMPLOYEES 2  1. ITEMS WORKED ON (ITEM NO., DESCRIPTION, STA. TO STA., FOREMAN)  2. INSTRUCTIONS RECEIVED FROM SOLUTIA  3. INSTRUCTIONS RECEIVED FROM USEPA	
WEATHER	
NUMBER OF HOURS WORKED ~ 4 NUMBER OF EMPLOYEES 2  1. ITEMS WORKED ON (ITEM NO., DESCRIPTION, STA. TO STA., FOREMAN) 2. INSTRUCTIONS RECEIVED FROM SOLUTIA	
TITEMS WORKED ON (ITEM NO., DESCRIPTION, STA. TO STA., FOREMAN)      INSTRUCTIONS RECEIVED FROM SOLUTIA	70°
2. INSTRUCTIONS RECEIVED FROM SQLUTIA	
4. DEVIATIONS  5. VISITORS (NAMES & TITLES)  6. EQUIPMENT  7. LUNCH MEETING COMMENTS:  8. UNUSUAL EVENTS (FIRE, FLOOD, STORM, LABOR DISPUTES, ETC.)	
9. REMARKS:	
1. c) Observed circus points for Borrow Pit & creek segment	/ <u>'</u>
b) selected scripte lucchons in CS E	
· · · · · · · · · · · · · · · · · · ·	
	_ <del>_</del>
Given to we for 9/2/199 BiyJam	
106% 10 0000101	
·	
IF ADDITIONAL SPACE IS REQUIRED, RECORD ON REVERSE SIDE PRINTED NAME / SIGNATURE OF PREPARER / DATE	

#### DAILY WORK LOG

DAILY WORK LOG	
DATE 9/21/99	
PROJECT NAME Solution Songet I PROJECT LOCATION Dead Creek	
WEATHER OVercest PRECIPITATION TEMPERATURE ~ 70	کی۔ 
NUMBER OF HOURS WORKED NUMBER OF EMPLOYEES	
1. ITEMS WORKED ON (ITEM NO., DESCRIPTION, STA. TO STA., FOREMAN) 2. INSTRUCTIONS RECEIVED FROM SOLUTIA 3. INSTRUCTIONS RECEIVED FROM USEPA 4. DEVIATIONS 5. VISITORS (NAMES & TITLES) 6. EQUIPMENT 7. LUNCH MEETING COMMENTS: 8. UNUSUAL EVENTS (FIRE, FLOOD, STORM, LABOR DISPUTES, ETC.) 9. REMARKS:	
1. Completed vecon survey for B, C, D, E, F, site N B. and set are hish trap in Barrow Pit	<u>7</u>
2. None	
3. None	
4. None	_
5.	_
6. D-Net, QST	
7. None	_
8. Water flow to CS-F is du mainly to discharge from Phillips Pipeline	<u>_</u>
inen to weston 1/21/19 7:55 ar ful	
IF ADDITIONAL SPACE IS REQUIRED, RECORD ON REVERSE SIDE  Chevles Menzie / Claffer PRINTED NAME / SIGNATURE OF PREPARER / DATE	

			DATE 9/22/	99
PROJECT NAME Solutia Sc	get Tr	PROJECT LOCATION	Relevence Los	
WEATHER SUNT	PRECIPITATION	none	_ TEMPERATURE S	
NUMBER OF HOURS WORKED		NUMBER OF EMPLOYEES		
ITEMS WORKED ON (ITEM NO DES     INSTRUCTIONS RECEIVED FROM S     INSTRUCTIONS RECEIVED FROM L	OLUTIA	O STA., FOREMAN)		
4. DEVIATIONS 5. VISITORS (NAMES & TITLES) 6. EQUIPMENT 7. LUNCH MEETING COMMENTS:				
8. UNUSUAL EVENTS (FIRE, FLOOD, S 9. REMARKS:	STORM, LABOR DI	SPUTES, ETC.)		
1. Selectal two re in vicinity of Eu the Level (RS-1) of Lever at an cond Fantais Ca	and, a	lelet west of west pond	and pervelled t	veek k vest ving
permission faccess	must be	0	m Preirie D. - L. We wer	Part
unable to deter	mine car	nership for	R5-2. Hewe	cer
if is perrelled	to To	ake Rd. Tw	e lecahen	<u>, ch</u>
Tacke Rd T	het migh	t here into	ave	
Farris @ 9300 Form at 94	Tacke 1	ed and so	chaefer Stuck	
2 /Vone 3. None				
4. None (except el 5. None 6. GPS, comera	iminate Ho	roling Ditch	at ret crea)	
7. None 9. None 9. None				
IF ADDITIONAL SPACE IS REQUIRE RECORD ON REVERSE SIDE	ED, <u>C.1</u>	Menzielle PRINTED NAME / SIGNAT	1 9/22/99 FURE OF PREPARER / DA	ATE

Work Forecast for the day(week) 9/20/99 Date: 9/16/99
Project Name: Solution Songet fre Project Location: Borrow Pit Retrience
Company Name: Menzie + Cum Associates (MCA)
1. List Work Items and Locations Scheduled for Next Day/Week:
O Recon survey of Dead creek to jelenhity Us/z tion Joca hins
(2) Recon Jury of Borrey Pit
(3) Select Reference Locations
4) Que l'tative examine tion of plants inverte brates, cryfish presence
Given to Weston/EPA (20 3.25 pm on 9/16/99
If ADDITONAL SPACE IS REQUIRED, RECORD ON REVERSE SIDE  Name/Signature/Date of Freparer  Wenter Menters  Name/Signature/Date of Freparer

Work Forecast for the day/week: 9/20/99 Date: 9/16/89	
Project Name: Schutin Schut Rec Troject Location: Deel Creek  Company Name: MCA (Mehzie Cura)	
Company Name: MCA (Menzie Cyra)	
1. List Work Items and Locations Scheduled for Next Day/Week:	
1) Orientation ~ 1300 k	
(2) Begin recon of Donal Creek	
Clear Menzie 9	/、
If ADDITONAL SPACE IS REQUIRED, Name/Signature/Date of Prepared RECORD ON REVERSE SIDE	

Work Forecast for the day week:	dcy-	9/21/94	7 Dat	e: <u>9/21/99</u>
Project Name: Solutice Su	nget fre	_ / Project	t Location:	lecal Creek
Company Name: Menzic	Cura	+ As.	rocides	
1. List Work Items and Locations				
Ecological Recon	for	Dead	Creek.	: B, C, I)
<u> </u>				
Given to wester 9	21/99 8:	45au		
	6	le M	Cris	9/21/99

If ADDITONAL SPACE IS REQUIRED, RECORD ON REVERSE SIDE

Name/Signature/Date of Preparer
Charles Menzie

Work Forecast for the day/week: $9/22/99$ Date: $9/22/99$
Project Name: Solutia Songet I Project Location: Reference Locate
Company Name: Menzie - Cura
1. List Work Items and Locations Scheduled for Next Day/Week:
a) select reference locations (two)
b) Check cray fish trap
Grento wester 1/22/44 7:55 aux OP
O/M

Name/Signature/Date of Preparer

If ADDITONAL SPACE IS REQUIRED, RECORD ON REVERSE SIDE

# SAFETY MEETING FORM

2 ONDUCTED BY / COMPANY : Charlie M.	enzie / Menzie - C	DATE 4/20/99
PROJECT NAME Sunget Area 1	•	
WEATHER Over cost PRECIF		
NUMBER OF HOURS WORKED	NUMBER OF EMP	LOYEES
SCHEDULED WORK:     REFERENCES TO APPROPRIATE SECTION COMMENTS:     SPECIFIC HEALTH AND SAFETY ISSUES WITH SCHEDUCE.     COMMENTS:	JLED WORK:	
1) Conduct recon Survey 2) Eco Risk Assessment	L J	
3) avoid direct skin/	eye contact wit	th creek sediment o
<u>V</u>	while in a	retection gloves when
5) None		
ATTENDANCE: EMPLOYEE NAME (print)  EMPLOYEE  FOR LINE  Lin best & Perr  Charles Menzie  John Fiore	E SIGNATURE  NO SORT	COMPANY  then zig - Cura  So (-tia  RFW)  Menere, - Cun  Mayerick
Given to wester at	3:55 pm on 9/	/w/99
IF ADDITIONAL SPACE IS REQUIRED, RECORD ON REVERSE SIDE	Charles Menz PRINTED NAM 9/20	EASIGNATURE OF PREPARER

#### SAFETY MEETING FORM

ONDLICTED BY / COMPANY :	herles Menzie	DATE 9/21/99
ROJECT NAME Solution Sour	herles Menzie  cut Avec / PROJECT LOCATION  PRECIPITATION	Decel Crook
JEATHER DEVILY clouds	PRECIPITATION home	TEMPERATURE
$\sigma$		2
JMBER OF HOURS WORKED	NUMBER OF EMPLOY	EES
SCHEDULED WORK: REFERENCES TO APPROPRIATE	SECTION OF ESP & HASD	
. HEALTH AND SAFETY ISSUES W	ITH SCHEDULED WORK:	
SPECIFIC HEALTH AND SAFETY COMMENTS:	ISSUES REQUIRING ATTENTION:	······································
1. Continue ecologe	Day 2 y Recon	
<i>J</i>		
2. MCA Ecological	Risk Werkplan Sect 4.	2./
	confect with sediment	+ water
- poison		
4. none		
TTENDANCE: MPLOYEE NAME (print)	EMPLOYEE SIGNATURE	COMPANY RFU
John Fibre	Market Ra Colorelle	Mayerck
MICHAGE OMBRACHER	Libert 1	Sil-tra
Catherine togasty	Took and the sty	Menzie-Cura
		merete - Chi
Given to wester 9/	21/88 8:45 au	
· · · · · · · · · · · · · · · · · · ·	RED, Charles Menzic/	ol M
IF ADDITIONAL SPACE IS REQUIF RECORD ON REVERSE SIDE		SIGNATURE OF PREPARER
	· · · · · · · · · · · · · · · · · · ·	
	Ç	121/99

SAFETY MEETING FORM

	C. Menzie / Menzie	· · Cana	DATE 9/22/99
PROJECT NAME SEL	ia Area I PROJECT	LOCATION	Reference Areas
	·	one	TEMPERATURE ~ 50 - 7
WEATHER Sanny			2
NUMBER OF HOURS WORKED	NUMBER	OF EMPLOYEES	
1. SCHEDULED WORK:	RIATE SECTION OF FSP & HASP:		
3. HEALTH AND SAFETY ISSU	ES WITH SCHEDULED WORK:		
4. SPECIFIC HEALTH AND SAI 5. COMMENTS:	ETY ISSUES REQUIRING ATTENTI	ON:	
1. Select refu	erence locations		
2. MCA GAPP	4.2.1 Ecological	Recon	
3. Avail contr		+ Witer	
	or a gent mede		
+ None			
<u> </u>			
·			
ATTENDANCE:			
EMPLOYEE NAME (print)	EMPLOYEE SIGNATURE		COMPANY
C. Menzo	el M		a Menzie Cum
Katherine Fogasty	tarleying togate		Menzie-Cura Sul-tra
Kinbert & Perry			RFW
MICHAEL ONASSICHER	Y Hubril R. Ophnelle		<u>RFW</u>
Cyron to	weston 9/22/44 7:5	Jun Klf	
		_	
	C 1 / 1/4	. 10	1 M
IF ADDITIONAL SPACE IS RECORD ON REVERSE	EQUIRED, Chevies Me		ATURE OF PREPARER
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		7/22/7 DA	fe

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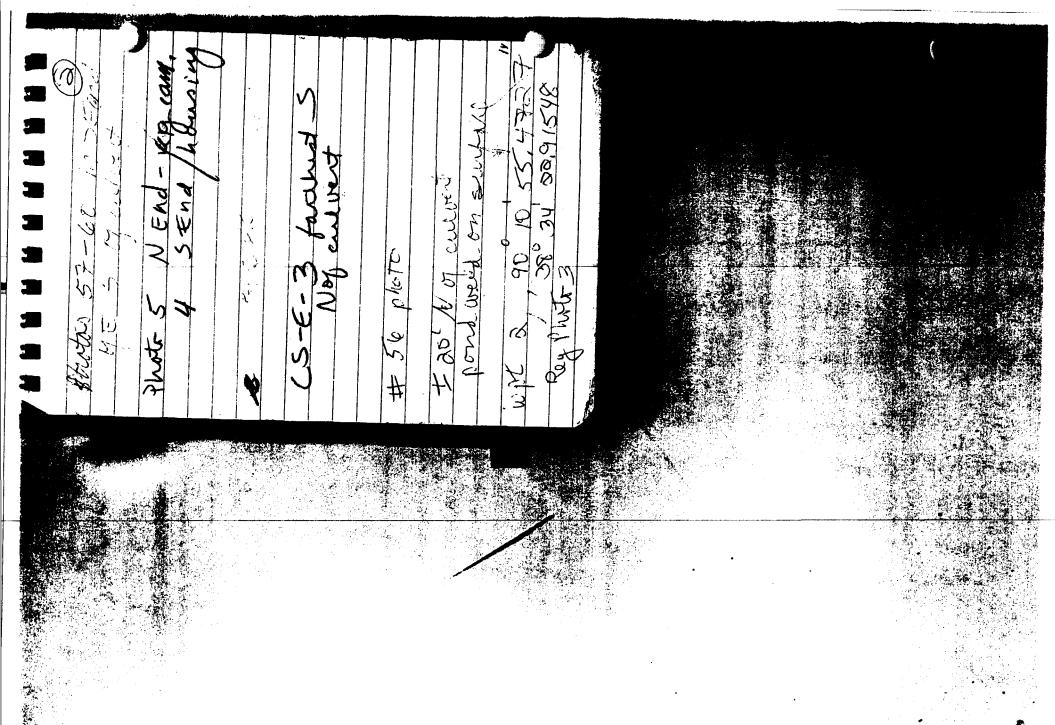
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Al-Weather Notebook

HID DOCKEL

ALL WEATHER WRITING PAPER

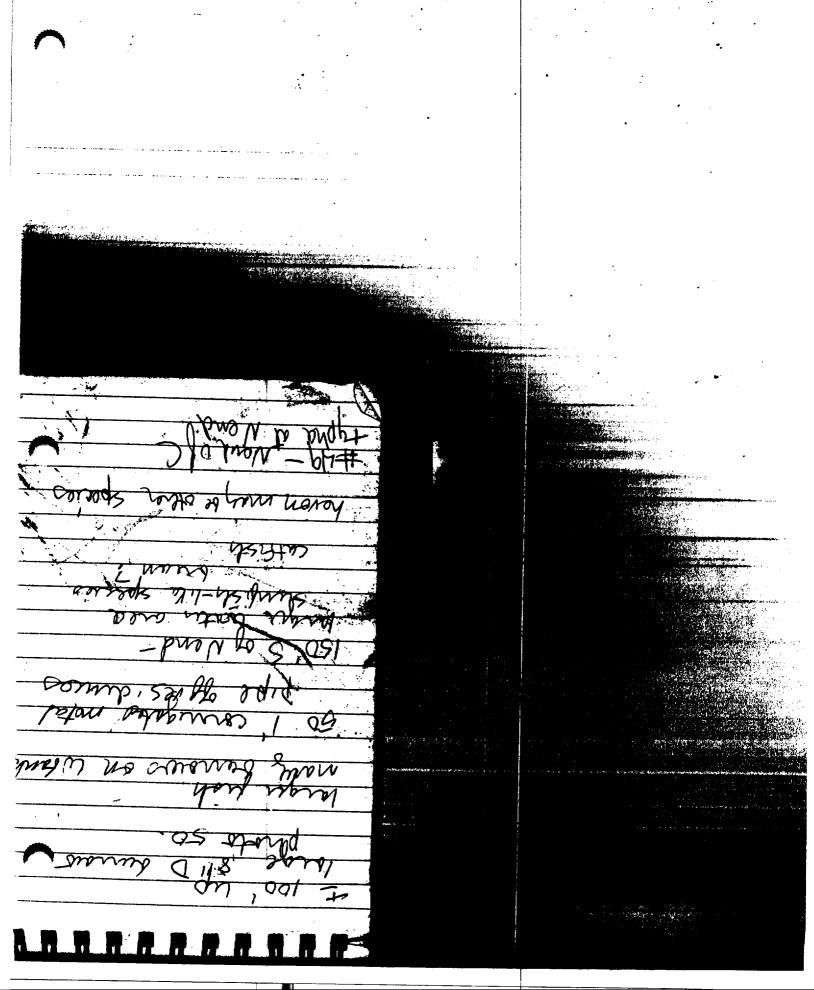
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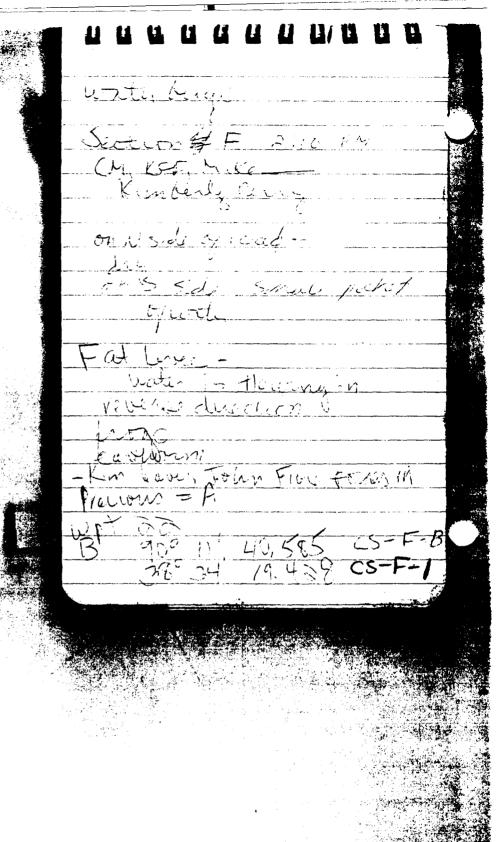
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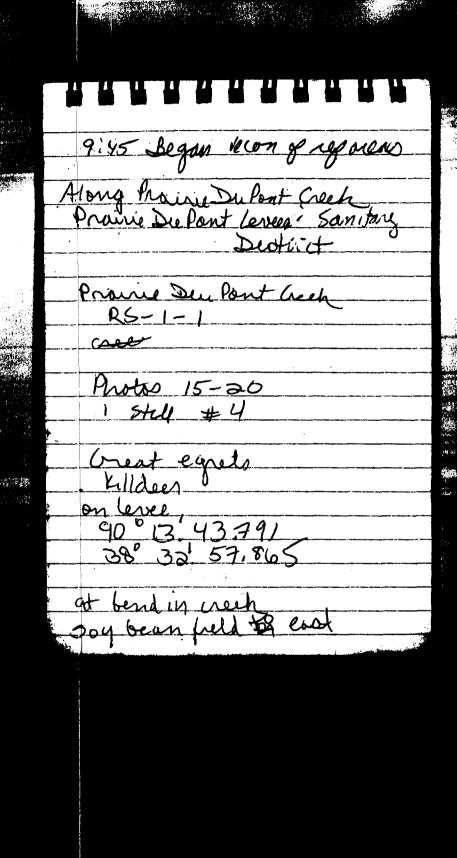
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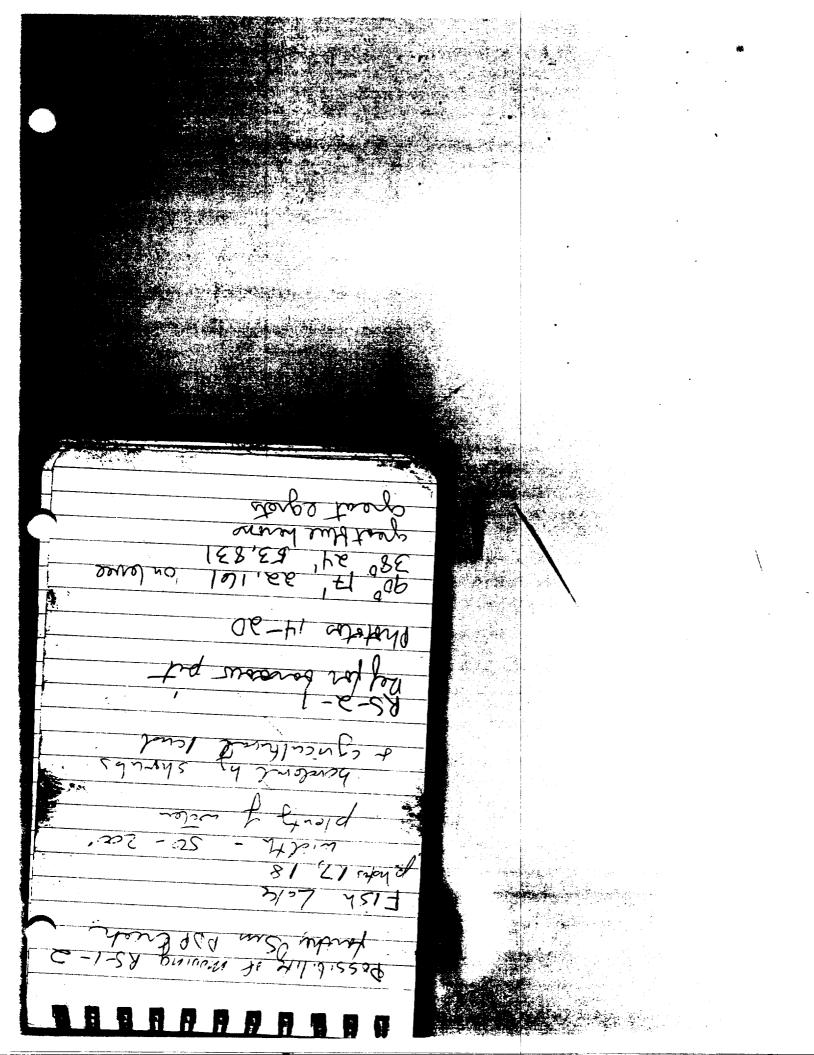
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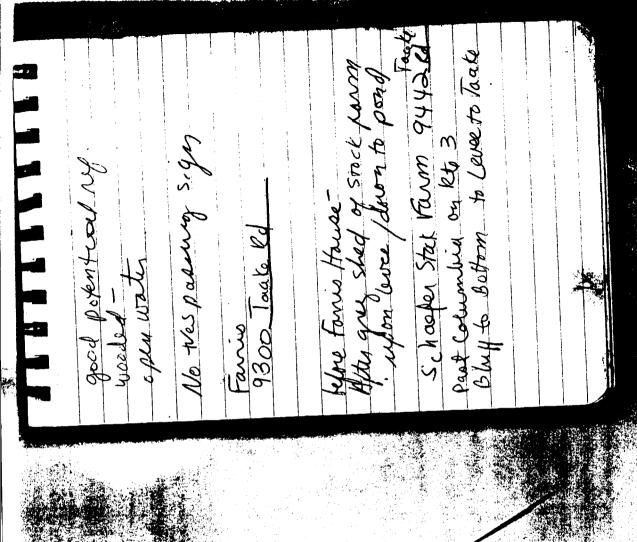
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#### 3.26 Sediment Toxicity Bioassays

#### 3.26.1 Rationale/Design

Sediment samples from the 0 to 2 inch (upper 5 cm) depth interval were collected at each of the 23 sediment triad locations in creek sectors B through F, the Borrow Pit, Site M, and the reference locations to evaluate the toxicity associated with site-related chemicals to benthic organisms. These samples were collocated with the sediment samples collected for sediment chemistry (Section 3.20), surface water samples collected for chemical analysis (Section 3.21), and benthic macroinvertebrates for community evaluation (Section 3.27).

The sediment toxicity tests will be used to evaluate whether chemicals in sediments are toxic to benthic invertebrates. Acute toxicity tests were conducted at the 23 sampling locations with the amphipod Hyalella azteca and the insect larvae Chironomus tentans in accordance with USEPA analytical methods. The laboratory SOPs for these analyses were presented in Appendix A of the QAPP. For stations where the results of acute toxicity tests indicated that survival did not significantly differ from that in reference locations and control sediments, chronic tests were also conducted for these two species according to USEPA methods. The SOPs for these methods are also in the QAPP. The sequential testing (acute followed by chronic) eliminated the need to set up and run long-term tests for sediments in which acute toxicity had already been demonstrated.

#### 3.26.2 QA/QC Procedures

Field duplicates were collected at a rate of one duplicate per 10 samples. Field duplicates were collected at Station 1 in the Borrow Pit and Creek Sector B-1 for sediment toxicity. The remaining types of QA/QC samples (equipment blanks, trip blanks, and MS/MSD samples) are not appropriate for sediment toxicity testing.

#### 3.26.3 Field Procedures

Prior to beginning fieldwork, Preparatory Inspection Meetings were held that were attended by a representative of each of the interested parties (Section 3.26.4).

Sediment samples were collected at the same times and locations as the chemical analysis and benthic macroinvertebrate community analysis samples with a tall Eckman grab. A stainless steel spoon was used to scoop out the top two inches of sediment from the Eckman. This sediment was then placed in a large, stainless steel bowl. Approximately nine grabs provided enough sediment for the chemistry samples and sediment toxicity samples. (The VOC samples were collected directly from the first grab.) Once a bowl was filled, the sediment was homogenized by stirring and the sample containers were then filled. In between sampling stations, sampling equipment was decontaminated by washing in an Alconox solution followed by rinses in deionized water, methanol, and deionized water.

Approximately 4 liters of sediment were collected from each location for the sediment toxicity testing. Sediment toxicity samples were put on ice immediately after collection. Chain-of-custody forms were completed for each sample. Samples were sent to Aquatec Biological Sciences in South Burlington, Vermont, the same day they were sampled, via overnight delivery.

#### 3.26.4 Documentation

Table 3.26.4 lists the sample stations where toxicity bioassay samples were collected. Figure 4 depicts these stations. The preparatory inspection meeting form for this task is in Section 3.26.4.1 and the chain-of-custody forms are in Section 3.26.4.2. Except for additional fish collection that occurred on November 1 through 3, 1999, the Main Sampling Event occurred on October 4 through 9, 1999. Sediment, invertebrate, and fish samples were collected concurrently. The Daily Work Logs, Work Forecasts, and Safety Meeting Forms for the Main Sampling Event are in Section 3.26.4.3 and the field notes are in Section 3.26.4.4. These forms and notes also apply to Sections 3.27 through 3.30.

Table 3.26.4
List of Sample Locations, Dates, and QA/QC Samples
Collected for Sediment Toxicity Bioassays
Sauget Area I

Sample ID	Station	Date Collected	QA/QC Samples
BTOX-B-1	Creek Sector B-1	10/5/99	Field Duplicate
BTOX-B-2	Creek Sector B-2	10/5/99	
BTOX-B-3	Creek Sector B-3	10/5/99	
ВТОХ-М	Site M	10/5/99	
BTOX-C-1	Creek Sector C-1	10/4/99	
BTOX-C-2	Creek Sector C-2	10/4/99	
BTOX-C-3	Creek Sector C-3	10/4/99	
BTOX-D-1	Creek Sector D-1	10/4/99	
BTOX-D-2	Creek Sector D-2	10/4/99	
BTOX-D-3	Creek Sector D-3	10/4/99	
BTOX-E-1	Creek Sector E-1	10/6/99	
BTOX-E-2	Creek Sector E-2	10/6/99	
BTOX-E-3	Creek Sector E-3	10/6/99	
BTOX-F-1	Creek Sector F-1	10/7/99	
BTOX-F-2	Creek Sector F-2	10/7/99	
BTOX-F-3	Creek Sector F-3	10/7/99	
BTOX-BP-1	Borrow Pit 1	10/6/99	Field Duplicate
BTOX-BP-2	Borrow Pit 2	10/7/99	
BTOX-BP-3	Borrow Pit 3	10/7/99	
	Reference Area 1-1 (Old		
BTOX-PDC-1	Prarie DuPont Creek)	10/8/99	
	Reference Area 1-2 (Old		
BTOX-PDC-2	Prarie DuPont Creek)	10/8/99	
	Reference Area 2-1		
BTOX-Ref2-1	(Long Slash Creek)	10/8/99	
BTOX-Ref2-2	Reference Area 2-2	10/8/99	

3.26.4.1 Preparatory Insepction Meeting Form

#### PREPARATORY INSPECTION MEETING

Conducted by/Company: Charles Menzie / Menzie Cara Date: 10/4/99
Conducted by/Company: Charles Menzie / Menzie Cara Date: 10/4/99 Project Name: Solution Aven I Task: Main Galagical Sampling of
1. Scheduled Work:
2. Equipment, Procedures, Personnel:
3. Ref. To App. Sec. of FSP/HASP:
4. Issues that could arise and how to resolve:
5. Solutia comments:
6. EPA comments:
1. Main empling event / Salimont (surficial)
2. Schment scapling, tried his scapling, invert scapling cvey his, plants. C. Menzie, k. regerty, S. Iterpher, K. Cerreto, M. Availcien, D. Levin, B. Amos, J. Perry  3. MCA QAPP 42.2-4.8.2
ever fish, plants. C. Menzie, k. regarty, S. Itenpuer,
K. Cerreto M. Availcien, D. Levin, B. Amos J. Perry
3. MCA QAPP 42.2 - 4.8.2
4. Key issues are related to bickgical sampling and
head to be made in field - certain organisms may
need to be made in field - certain organisms may
het be present
S. "
6.
b.
ATTENDANCE:
EMPLOYEE NAME (print) EMPLOYEE SIGNATURE COMPANY
-las Menzie MCA
Korhund a Joranto Korhevine Franke, renzu-Guna
Ken LAFFORTO KE STATE MANIERICK
Ken Greens Un and Marchera
Stoven Brodman 87-R RF. Weston
Eckle- CIII RF Western
AL CUE DOOL OBG
JOSEPH W. PERRY SOURCE OBG
IF ADDITIONAL SPACE IS REQUIRED. Chirles Menzie
RECORD ON REVERSE SIDE  RECORD ON REVERSE SIDE  PRINTED NAME/ SIGNATURE OF PREPARER
RECORD ON REVERSE SIDE FRINTED NAME 31GNATURE OF FREFARER
Given to wester 10/4/89 09:30 am to

#### 3.26.4.2 Chain-of-Custody

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# Aquatec Biological Sciences Chain-of-Custody Record

75 Green Mountain Drive South Burlington, VT 05403 TEL: (802) 860-1638 FAX: (802) 658-3189

COMPANY INFORMATION		COMPAN	Y'S PRO	JECT INFORM	MATION		SHIPPING INFORM	MATION			ME/CON PRESE			
Name: Menzie Cura & Associates  Address: One Courthouse Lane, Suite	. 1	Project Nam	e: <u>Dea</u>	d Creek Sedim	ent Tox	Carrier	r:		40C					
Chelmsford, MA 01824		Project Num	ber: <u>99</u>	9033		Airbill I	Number:		plastic					
Telephone: (978) 453-4300	1	Sampler Na	me(s): _	<del></del>					piaotic					]
Facsimile: (978) 453-7260	- 1					Date S	Shipped:		_					_
Contact Name: Ken Cerreto, Ph.D.									1 gal	,		. 1		
	1	Quote #:	3/99	Client Code:1	MENCUR	Hand [	Delivered:Yes	No	,					1
		ECTION	0040	COMPOSITE			411411/010 / 054	44546						
SAMPLE IDENTIFICATION	DATE	TIME	GRAB	COMPOSITE	MATRIX Sediment		ANALYSIS / REM alella azteca 10-d Sur			NUMB	ER OF	CONTA	NERS.	
BTOX-C-1	10/4					Hya Chiro	alella azteca 42-day C nomus tentans 10-d S hironomus tentans Ch	Chronic Toxicity Survival & Growth						
BTOK-C-1-2	10/4	,		V	Sediment	Hya Chiro	alella azteca 10-d Sur alella azteca 42-day C nomus tentans 10-d S hironomus tentans Ch	Chronic Toxicity Survival & Growth						
					Sediment	Hya Chiro	alella azteca 10-d Sur alella azteca 42-day C nomus tentans 10-d S hironomus tentans Ch	Chronic Toxicity Survival & Growth	i					
					Sediment	Hya Chiro	alella azteca 10-d Sur alella azteca 42-day C nomus tentans 10-d S hironomus tentans Ch	Chronic Toxicity Survival & Growth						
					Sediment	Hya Chiro	alella azteca 10-d Sur alella azteca 42-day C nomus tentans 10-d S hironomus tentans Ch	Chronic Toxicity Survival & Growth						
	DATE	9 19:00	<u>ار</u>	ved by: (signat			NOTES TO SAMPLER shipment. Please cov	(S): We recommen er sample labels wi	ith clear	tape (la	bels are	not wate	rproof)	during
Relinquished by: (slgnature)	DATÉ	TIME	Recei	ved by: (signat	ure)		Notes to Lab: Cool	er ambient tempe - /	rature	upon d	elivery:	°	С	
Relinquished by: (signature)	DATE	TIME	Recei	ved by: (signat	'ure)			ocless						

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# **Aquatec Biological Sciences**

Chain-of-Custody Record

75 Green Mountain Drive South Burlington, VT 05403 TEL: (802) 860-1638 FAX: (802) 658-3189

COMPANY INFORMATION		COMPA	NY'S PRO	JECT INFORM	IATION		SHIPPING INF	ORMATION	·			TAINER RVATIVE		
Name: Menzie Cura & Associates  Address: One Courthouse Lane, Suite	- [	Project Nar	ne: <u>Dea</u>	d Creek Sedim	ent Tox	Carrier	···		4ºC				_	
Chelmsford, MA 01824	1	Project Nur	ct Number: 99033 Airbill Number:						plastic					
Telephone: (978) 453-4300	i	Sampler Na	ime(s):						piasiic					
Facsimile: (978) 453-7260					. <del></del>	Date S	Shipped:			_				_
Contact Name: Ken Cerreto, Ph.D.									1 gal					
	1	Quote #:	3/99	Client Code:1	MENCUR	Hand (	Delivered:Y	esNo						
SAMPLE IDENTIFICATION	COLI	ECTION	GRAB	COMPOSITE	MATRIX		ANALYSIS /	REMARKS		NUMB	ER OF	CONTAI	NERS	
BTOX-C-3-2	10/4				Sediment	Hya Chiro	alella azteca 10-d alella azteca 42-d nomus tentans 10	Survival & Growth ay Chronic Toxicity 0-d Survival & Growth s Chronic Toxicity	/					
BTOX - D-3	10/1				Sediment	Hya Hya Chiro	alella azteca 10-d alella azteca 42-d nomus tentans 10	Survival & Growth ay Chronic Toxicity 0-d Survival & Growth s Chronic Toxicity	1	-, -,				
BTOX-0-3-2	0/4	,			Sediment	Hya Chiro	alella azteca 42-d nomus tentans 10	Survival & Growth ay Chronic Toxicity )-d Survival & Growth s Chronic Toxicity	/					
BTOX-12-2	10/4				Sediment	Hya Chiro	alella azteca 42-d nomus tentans 10	Survival & Growth ay Chronic Toxicity 0-d Survival & Growth s Chronic Toxicity	1					
BTOX-C-2	10/				Sediment	Hya Chiro Cl	alella azteca 42-d nomus tentans 10 hironomus tentan	Survival & Growth ay Chronic Toxicity 0-d Survival & Growth s Chronic Toxicity	/	,				
Relinquished by: (signature)  Tenneth VI Cerrot	DATE 10/4/9	5 19:α	Receiv ク	red by: (signati	ure)		NOTES TO SAMP shipment. Please	LER(S): We recommen cover sample labels w	d nestin ith clear	g sample tape (lai	es in ice bels are	to maint not wate	ain 4°C ( rproof)	during
Relinquished by: (signature)	DATE	TIME	Receiv	red by: (signati	ure)		Notes to Lab: 0	Cooler ambient tempe	erature	upon de	elivery:	0	C	
Relinquished by: (signature)	DATE	TIME	Receiv	red by: (signati	ure)		3	Coders						
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# Aquatec Biological Sciences Chain-of-Custody Record

75 Green Mountain Drive South Burlington, VT 05403 TEL: (802) 860-1638 FAX: (802) 658-3189

COMPANY INFORMATION		COMPAN	IY'S PRO.	JECT INFORM	IATION		SHIPPING	G INFORMAT	ION	VOLUME/CONTAINER TYPE/ PRESERVATIVE							
Name: Menzie Cura & Associates Address: One Courthouse Lane, Suite 2	2	Project Nan	ne: <u>Dead</u>	1 Creek Sedim	ent Tox	Carrier	:			4ºC							
Chelmsford, MA 01824 Telephone: (978) 453-4300	_			033		Airbill I	Number:	· · · · · · · · · · · · · · · · · · ·		plastic		/			1		
Facsimile: (978) 453-7260  Contact Name: Ken Cerreto, Ph.D.	1		· · · · · · · · · · · · · · · · · · ·			Date S	hipped: _	······		1 gal	_		_	_	_		
Contact Name. Ren Ceneral, Filip.		Quote #:	3/99	Client Code:	MENCUR	Hand I	Delivered:	Yes	No	, gai			· 1				
SAMPLE IDENTIFICATION	DAT	LECTION E TIME	GRAB	COMPOSITE	MATRIX Sediment	11		SIS / REMAR			NUMB	ER OF	CONTAI	NERS			
BTOX-D-2	10/2	1				Hya Chiroi Cl	alella azteca nomus tenta hironomus te	entans Chron	nic Toxicity ival & Growth ic Toxicity	/							
BTOX-D-2-2	10/	/			Sediment	Hye Chiro	alella azteca nomus tenta	i 10-d Surviva i 42-day Chro ins 10-d Surv entans Chron	nic Toxicity ival & Growth	/							
B-0X-D-1	10/	/			Sediment	Hya Chiro	alella azteca nomus tenta	10-d Surviva 142-day Chro 111-d Surv 111-d Surv 111-d Surv	nic Toxicity ival & Growth	1							
BTOX-D-1-2	10/	,			Sediment	Hyz Chiro	alelia azteca nomus tenta	a 10-d Surviva a 42-day Chro ans 10-d Surv antans Chron	nic Toxicity ival & Growth	1							
BTOX-C-3	10/4	,		-	Sediment	Hya Chiro	alella azteca nomus tenta	a 10-d Surviva a 42-day Chro ans 10-d Surv entans Chron	nic Toxicity ival & Growth	1							
Relinquished by (signature)	DATE	TIME 19:00		red by: (signat	ure)				We recommen ample labels w						during		
Relinquished by: (signature)	DATE	TIME	Receiv	red by: (signat	ure)		Notes to La	ab: Cooler a	mbient tempe	rature	upon de	elivery:	O	С			
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Serial Number	1	<u>,</u>	7	9	1	0
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SL SAVANNAH LABORATORIES  SERVIRONMENTAL SERVICES, ING. AG WATELL COLCUENTA, NT  ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD  [In two (3) coolers]  PROJECT REFERENCE  PROJECT NO.  PROJEC	<ul> <li>2846 Industria</li> <li>414 SW 12th</li> <li>900 Lakeside</li> <li>6712 Benjamin</li> </ul>	e Avenue, Savanna al Plaza Drive, Talla Avenue, Deerfield Drive, Mobile, AL 3 in Road, Suite 100, ive, Suite 110, Dest	hassee, FL 32301 Beach, FL 33442 66693 Tampa, FL 33634	Phone: (912) 354-76 Phone: (904) 878-39 Phone: (954) 421-74 Phone: (334) 666-66 Phone: (813) 885-74 Phone: (504) 764-11	994 Fax: (904) 8' 400 Fax: (954) 4' 633 Fax: (334) 6' 427 Fax: (813) 8'	78-9504 21-2584 66-6696 35-7049 25-1163
CLIENT NAME MENZIL - CUI Q CLIENT PROJECT MANAGER  CLIENT ADDRESS (CITY, STATE, ZIP)  I Courthause Lane Suit 2 Chalmofuld HA					EXPEDITE DELIVERY	D REPORT (surcharge)
SAMPLE SL	NOW /	/ /		_/_/	Date Due:	
DATE TIME NO SAMPLE IDENTIFICATION AGES	3 NOI	IMBER OF CON	TAINERS SUBMITT	En	REMARK	5
10/5/99 9:45 BTOX-B-1	2		<del>                                     </del>			
10/5/99 14:10 BTOX-B-1 (dupe) X						
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195/99 9:00 100x-6-3	9		<del> </del>			
1/5/99 13:40 BTOX-M	9					
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RECEIVED BY (SIGNATURE) DATE TIME RECEIVED BY (SIGNATURE	)	DATE TIME	RECEIVED BY: (SIG	NATURE)	DATE	TIME
LABORA	TORY USE ON	LY				
<del></del>	JSTODY SEAL NO.	SL LOG NO.	LABORATORY F	REMARKS:		
Tyes No.		· ·				

Project No.	Project	Name:		- \ \ / <		Project Locat			··-		MENTIE CUIDA & ACCOCIATED INC
648B	కు	uget	He	I- Dead G	ueh	Souget	/Cahok	Lia II	/		MENZIE-CURA & ASSOCIATES, INC.  1 COURTHOUSE LANE, SUITE 2
DATE: 10/	6/90	7						es Require	ed	Ţ	TEL: 978/453-4300 FAX: 978/453-7260
			, K	Fogotty			note				
SAMPLE ID	Date	Gomp.	TIMO	Station Locations		No. of Containers	See				NOTES
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Relinquished By	<del></del>	re) U	0	Date	Time	Received By: (Sig	jnature)		Date	Time	C. tentans acute/
Relinquished By	: (Signatu	re)		Date	Time	Received By: (Sig	jnature)		Date	Time	Note () H.artera/ C. tentans acute/ cononic sediment to xicity tests
Laboratory:	A90	eated	h	<u> </u>		Phone:			1	<del>1</del>	TO KICITY TESTS
Contact Per	son:	Phil	. Doi	oney	······································	* <u></u>			·		
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Project No.	Project Dea	Name: d Ca	eh.	- Sauget A	veaI	Project Locat	ion: /Caho	kia,II,		MENZIE-CURA & ASSOCIATES, INC. 1 COURTHOUSE LANE, SUITE 2	
DATE: 10)	7/90	1					Analy	ses Require	ed	ſ	TEL: 978/453-4300 FAX: 978/453-7260
SAMPLERS (	J. Mo	nża	, K	Fogarty			Hasteras, Ctentano acuticani				
SAMPLE ID	Date	Tine Gemp.	Greb	Station Locations		No. of Containers	1 7 9 2 4 3				NOTES
BP-2	10/7/99	9:30		Barrow Pit		a	X		7		
F-1	17	15:00		Dead Creek-S	ectionF	a	X				
F-2		16:10				٦	X				
F-3	4	10:45		$\overline{V}$	A	a .	X				
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Laboratory: Contact Per	Agua	rtech				Phone:				I	
Contact Per	son: $ ho_l$	hil Da	owne	y							

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Project No.	Project	Name:				Project Locati	on.				r
-	648B Dead Creek-Souget Avant			Sauget-Cahohia, III.			MENZIE-CURA & ASSOCIATES, INC. 1 COURTHOUSE LANE, SUITE 2				
1	8/99			<b>V</b>		,	Analyses				CHELMSFORD, MA 01824 TEL: 978/453-4300 FAX: 978/453-7260
	C. Ma	uri	, "	- Fogarty			tor a				
SAMPLE ID	Date	TINY Comp.	Grab	Station Locations		No. of Containers	またない。				NOTES
bDC-1	10/8/4	9:30		Rearie dulont (	rek	2	X				
BDC-3	1/	11:20		n n	11	2	X				
Refa-1	W	16:30		Rox Creek		2	X				
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Laboratory:	Agu	atech	<b>_</b>			Phone:					
Contact Person Phil Downey											
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		Project					Project Locat	lon:					
	648B	Dea	d Cre	in	-Sauget Avea.	I	Sauget	Sauget/Cahokia, III.		MENZIE-CURA & ASSOCIATES, INC.  1 COURTHOUSE LANE, SUITE 2			
	/5/	alaa						Anal		equired			CHELMSFORD, MA 01824
	DATE: /b/c	1/47 C. Me	n rii	, K.	Fozarte	<del>.</del>		H.azkeet C.tentano peut t chrai					TEL: 978/453-4300 FAX: 978/453-7260
	SAMPLE ID	Date	Time Comp.		Station Locations		No. of Containers	H.az C. ter					NOTES
4076	Refa-a	10/9/49	10:30		Reference Borrow D	it	ュ	V					
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	Relinquished By:	(Signature	•)		Date	Time	Received By: (Signature) Date Time						
	Laboratory: Contact Per	Agu	eatecl	1			Phone:						
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3.26.4.3 Daily Work Logs, Work Forecasts, Safety Meeting Forms

PROJECT NAME Sullhi Are I PROJECT LOCATION Dead Creek  WEATHER Clandy - Jumpy PRECIPITATION Arm TEMPERATURE 50-70  NUMBER OF HOURS WORKED S NUMBER OF EMPLOYEES 7  1 THEMS WORKED ON LITEMNO, DESCRIPTION, STA TO STA, FOREMAN)  2. INSTRUCTIONS RECEIVED FROM SOLUTIA  3. INSTRUCTIONS RECEIVED FROM SOLUTIA  3. INSTRUCTIONS RECEIVED FROM USEPA  4. DEVIATIONS  5. VISITORS (NAMES & TITLES)  6. EQUIPMENT  7. LUNCH MEETING COMMENTS  8. UNUSUAL EVENTS IFIRE FLOOD STORM LABOR DISPUTES ETC.)  9. REMARKS  1. c) Completed Fried scapling of C-1, C-2, C-3  6. Completed plant Scapling, invertibre to (Small) scapling, in C + D  c) confected freque fith comple from D; more everileble  1. C. hat are collected at fish there (to hold)  2. home  3. home  4. devictions—took whole plant scaple of Vine-1/16c  Discriptions  5. Home  6. Sediment scapling of ecological scapling  1. April  2. April  2. April  2. April  3. April  4. April  4. April  4. April  5. April  5. April  5. April  5. April  6. April  6. April  7. April  8. April  8. Ap				, ,	
NUMBER OF HOURS WORKED & NUMBER OF EMPLOYEES 7  NUMBER OF HOURS WORKED & NUMBER OF EMPLOYEES 7  1 ITEMS WORKED ON ITEM NO. DESCRIPTION STA TO STA. FOREMAN)  2. INSTRUCTIONS RECEIVED FROM SOLUTIA  3. INSTRUCTIONS RECEIVED FROM USEPA  4. DEVARITORS  5. VISITORS INAMES & ITILES)  6. EQUIPMENT  7. LUNCH MEETING COMMENTS:  8. UMISUAL EVENTS (FIRE FLOOD, STORM, LABOR DISPUTES, ETC.)  9. REMARKS:  1. C) Completed trical scupling of Cil, C-2, C-3  400 (D-1, D-2, D-3)  6) Completed plant scupling of Cil, C-2, C-3  401 (D-1, D-2, D-3)  6) Completed plant scupling, invertibrate (singil) scupling, in C + D  c) collected foregot fish completion D; norme everificate in C but we collected to this there (to bild)  2. home  4. devictions—text whole plant scuple of vine-file  plant + did not separate root of stam—discussed with Steve Moduran of Weston  5. home  6. Seliment scupling of ecological scupling  7. home  16. Seliment scupling of ecological scupling  17. home				DATE 10/4/9	9
NUMBER OF HOURS WORKED & NUMBER OF EMPLOYEES 7  1 ITEMS WORKED ON (ITEM NO. DESCRIPTION. STA. TO STA. FOREMAN) 2. INSTRUCTIONS RECEIVED FROM SOLUTIA 3. INSTRUCTIONS RECEIVED FROM USEPA 4. DEVIATIONS 6. EQUIPMENT 7. LUNCH MEETING COMMENTS. 8. UNISUAL EVENTS (FIRE FLOOD. STORM LABOR DISPUTES. ETC.) 9. REMARKS. 1. C) Completed fried scupling of C-1, C-2, C-3  4. D-1, D-2, D-3  6) Completed plant Scupling of C-1, C-2, C-3  6) Completed plant Scupling, invertibrate (Snuil) scupling, in C + D  c) collected burge fish comple from D; norm excileble in C had we collected (of Fish there (to held))  d) hebitat evelue has for E + D  2. home 3. home 4. devictory - track whale plant scuple of Vine-like plant of discovered with Steve Meading Disputed Scupling  5. home 6. Sediment scupling & ecological scupling 7. home 16. Sediment scupling & ecological scupling 7. home 16. Sediment scupling & ecological scupling 7. home 16. RECORD ON REVERSE SIDE  PRINTED NAME / SIGNATURE OF PREPARER / DATE	PROJECT NAME Southin Area	J	PROJECT LOCATION	Dend Cre	relo
NUMBER OF HOURS WORKED & NUMBER OF EMPLOYEES 7  1 ITEMS WORKED ON (ITEM NO. DESCRIPTION. STA TO STA. FOREMAN) 2. INSTRUCTIONS RECEIVED FROM SOLUTIA 3. INSTRUCTIONS RECEIVED FROM USEPA 4. DEVIATIONS 6. EQUIPMENT 7. LUNCH MEETING COMMENTS. 8. UNISUAL EVENTS (FIRE FLOOD. STORM LABOR DISPUTES. ETC.) 9. REMARKS. 1. C) Completed fried scupling of C-1, C-2, C-3  4. D-1, D-2, D-3  6) Completed plant Scupling, invertibrate (Singil) scupling, in C + D  c) collected forego fish comple from D; norm excilcted in C but we collected cot fish there (to held)  d) hebitat evelve has for E + D  2. home 3. home 4. devictory - track whole plant scuple of Vine-like plant of vine-like plant of Stem - discussed with Steve Medical scupling.  5. home 6. sediment scupling & ecological scupling.  1. Home 1. Hadditional space is required. Check Menzic Menzic Menzic Preparer (Date of Record on Reverse side)  1. PRINTED NAME / SIGNATURE OF PREPARER (DATE)	WEATHER cloudy - sunny	PRECIPITATION	ON home	TEMPERATURE	5 <u>0 - 70</u>
2. INSTRUCTIONS RECEIVED FROM SOLUTIA 3. INSTRUCTIONS RECEIVED FROM USEPA 4. DEVIATIONS 5. VISITORS INAMES & TITLES) 5. EQUIPMENT 7. LUNCH MEETING COMMENTS. 8. UNUSUAL EVENTS (FIRE FLOOD STORM LABOR DISPUTES ETC.) 9. REMARKS. 7. c) Completed fried scaping of C-1, C-2, C-3  the D-1, D-2, D-3  b) Completed plant scaping invertibrate (small) scaping in C+D  c) collected forego fich cample from D; norm excileble in C+D  c) collected forego fich cample from D; norm excileble in C+D  d) helplat ever fue from for C+D  2. home 3. norm 4. devictory - took whole plant scappe of Vine-1/16  plant + died not separate rest of stam - discurred with Steve Moodman of Weston  5. home 6. Seliment scapping of ecological scapping 7. home 16. Seliment scapping 8. PRINTED NAME / SIGNATURE OF PREPARER! DATE			NUMBER OF EMPLOYEES	<del></del>	
1. c) Completed fried scupling of C-1, C-2, C-3  Be D-1, D-2, D-3  b) completed plant scupling, inwrithrate (small) scupling, in C + D  c) collected forege fish scuple from D; none everleble in C but we collected sof fish there (to hold)  d) helphat evelue hous for C + D  2. home  3. none  4. devictory - took while plant scuple of Vine-like plant + died not separate root a stam - discussed with steve Bloodman of Weston  5. home  6. Sediment scupling of ecological scupling  7. hore  If ADDITIONAL SPACE IS REQUIRED. Checks Menzic Aller of PREPARER / DATE	2. INSTRUCTIONS RECEIVED FROM S 3. INSTRUCTIONS RECEIVED FROM U 4. DEVIATIONS 5. VISITORS (NAMES & TITLES) 6. EQUIPMENT 7. LUNCH MEETING COMMENTS: 8. UNUSUAL EVENTS (FIRE, FLOOD, S	SOLUTIA ISEPA			
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chut we collected not fish there (to hold)  d) holy, but evelue hours for & D  2. home  3. none  4. devictory - took whole plant sample of vine-like  plant + did not separate root a stam - discurred  with steve Machinen of Weston  5. home  6. seliment sampling & ecological samplines  7. home  IF ADDITIONAL SPACE IS REQUIRED, RECORD ON REVERSE SIDE  PRINTED NAME / SIGNATURE OF PREPARER / DATE	b) completed plan	+ Scupli	n, inwithrate	(snull)scapli	ار ار
2. home  3. none  4. devictions - tock whole plant sample of vine-like  plant + died not separate root a stem - discussed  with steve Madman of Weston  5. hom  6. seliment sampling of eadquited sampling  7. home  IF ADDITIONAL SPACE IS REQUIRED, RECORD ON REVERSE SIDE  PRINTED NAME / SIGNATURE OF PREPARER / DATE	0		/		
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plant + did not separate root a stem - discussed  with Steve Madelman of Weston  5. home  6. sediment surpling of ecological surpling  7. home  IF ADDITIONAL SPACE IS REQUIRED.  RECORD ON REVERSE SIDE  PRINTED NAME / SIGNATURE OF PREPARER / DATE	3. none				
with Steve Medium of Weston  5. how  6. seliment simpling of ecclesive simpling  7. hore  IF ADDITIONAL SPACE IS REQUIRED. Checks Menzie Menzie PRINTED NAME / SIGNATURE OF PREPARER / DATE	4. devictory - tock	whole	lout scaple o	f Vine-like	
5. home 6. seliment simpling of ecclesival simpling 7. home IF ADDITIONAL SPACE IS REQUIRED. RECORD ON REVERSE SIDE  PRINTED NAME / SIGNATURE OF PREPARER / DATE	• • • • • • • • • • • • • • • • • • •		perate rout a	stem - disci	wseel
6. Selinent scupling & ecclesical scupling  7. hore  IF ADDITIONAL SPACE IS REQUIRED.  RECORD ON REVERSE SIDE  PRINTED NAME / SIGNATURE OF PREPARER / DATE		Medinen	of Weston		
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IF ADDITIONAL SPACE IS REQUIRED.  RECORD ON REVERSE SIDE  PRINTED NAME / SIGNATURE OF PREPARER / DATE		y 8 ecc	lyital surpline	7	
RECORD ON REVERSE SIDE PRINTED NAME / SIGNATURE OF PREPARER / DATE		o. Chev	les Menzie /Pla	Mr.	<u> </u>
	RECORD ON REVERSE SIDE		PRINTED NAME / SIGNAT		DATE

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DATE	+
PROJECT NAME Solution Avea I PROJECT LOCATION Decl C	T
WEATHER SUNNY PRECIPITATION home TEMPERATURE	60-7
NUMBER OF HOURS WORKED NUMBER OF EMPLOYEES 7	
1. ITEMS WORKED ON (ITEM NO., DESCRIPTION, STA, TO STA, FOREMAN) 2. INSTRUCTIONS RECEIVED FROM SOLUTIA 3. INSTRUCTIONS RECEIVED FROM USEPA 4. DEVIATIONS 5. VISITORS (NAMES & TITLES) 6. EQUIPMENT 7. LUNCH MEETING COMMENTS: 8. UNUSUAL EVENTS (FIRE, FLOOD, STORM, LABOR DISPUTES, ETC.) 9. REMARKS:	
1. a) completed B and M	
b) set fish trops in borrow pir	
Z hore	
3 pore	
4 neni	
5 pone	<u> </u>
6 seliment, ecological, fish collections	=
) here	
8 none	<u>.</u>
9 reinterced importance / PFDs	
Given to moton 10/6/99 0740 14/1	1
IF ADDITIONAL SPACE IS REQUIRED, RECORD ON REVERSE SIDE PRINTED NAME / SIGNATURE OF PREPAREN /	5/9G DATE

				DATE /0/6/99
PROJECT NAM	Soluti	Aven I	PROJECT LOCATION	Doed Corok
WEATHER	schhy	PRECIPITAT	TION NOW	TEMPERATURE 60 - 75
	OURS WORKED _		NUMBER OF EMPLOYE	ES <u>7</u>
2. INSTRUCT	RKED ON (ITEM NO IONS RECEIVED F IONS RECEIVED F	ROM SOLUTIA	TA. TO STA., FOREMAN)	
4. DEVIATION 5. VISITORS	NS (NAMES & TITLES)	NOW OSEFA		
6. EQUIPMEN 7. LUNCH ME	ETING COMMENTS	S: DOD, STORM, LABO	R DISPLITES ETC.)	
9. REMARKS:	EVENIO ITINE, PL		, Dorotto, Etc.)	
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	iona letical	Bonn Pi	+ Steller /	end 2
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_a)	collected	Kil		
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			DATE (0/5/19	· <del>-</del>
PROJECT NAME Solution Avec -	TPR	OJECT LOCATION	Dead Creek/R	of hea
WEATHER PREC	CIPITATION		TEMPERATURE	~ 70
NUMBER OF HOURS WORKED8		MBER OF EMPLOYE		
ITEMS WORKED ON (ITEM NO., DESCRIPT     INSTRUCTIONS RECEIVED FROM SOLUTI     INSTRUCTIONS RECEIVED FROM USEPA     DEVIATIONS     VISITORS (NAMES & TITLES)     EQUIPMENT     LUNCH MEETING COMMENTS:     UNUSUAL EVENTS (FIRE, FLOOD, STORM     REMARKS.	A			
1. a) eco + seliment	Sch	ling ait		
F1, F2, F	3 3	2		
Old Previe	ntry Depon	el re	f cva 1	
				<del>-</del>
6 in to wester 10/8/89	0745	<b>₩</b> /		
IF ADDITIONAL SPACE IS REQUIRED, RECORD ON REVERSE SIDE	harles p	Menzie / CLI	Millo   E   ATURE OF PREPARER	97 IDATE

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	DAILY WO	RK LOG	
			DATE 10/8/99 Dead Creek and
PROJECT NAME Solution Sup	three I p	ROJECT LOCATION	Ref Aras
WEATHER clandy			TEMPERATURE
NUMBER OF HOURS WORKED		IUMBER OF EMPLOYE	es <u>7</u>
ITEMS WORKED ON (ITEM NO.     INSTRUCTIONS RECEIVED FR.		O STA., FOREMAN)	
3. INSTRUCTIONS RECEIVED FR	OM USEPA		
4. DEVIATIONS 5. VISITORS (NAMES & TITLES)			
6. EQUIPMENT 7. LUNCH MEETING COMMENTS:	· · · · · · · · · · · · · · · · · · ·		
8. UNUSUAL EVENTS (FIRE, FLO	DD, STORM, LABOR DI	SPUTES, ETC.)	
9. REMARKS:	<del> </del>		
1. c) completed 50	upling at	station	FI chol FZ
	el sempline	O Pa	£-7/
b) completed a	a sexpille	The Me	<u> </u>
c) condeted	fish semp	lines et	Ref 7-7
4. In the mor	ning we	selected	new reference
areas because	se live of	id not	here occess
to the a	ea lite.	selection	during
150000	7		
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8. notremen	helped w	locate	The vec
re fevence		extremets	beinful =
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his name	is Isruae	white	11.1.1
IF ADDITIONAL SPACE IS REQU RECORD ON REVERSE SID		RINTED NAME / SIGNA	ATURE OF PREPARER / DATE
Gian to wes	bn Kuf (°/101	189	

		DATE 10/9/79
PROJECT NAME Solution Sought Aca I WEATHER <u>Cloudy</u> - Sunny PRECIPITATI	PROJECT LOCATION	Ref Avec s  TEMPERATURE 70
NUMBER OF HOURS WORKED	NUMBER OF EMPLOYEE	
ITEMS WORKED ON (ITEM NO., DESCRIPTION, ST     INSTRUCTIONS RECEIVED FROM SOLUTIA     INSTRUCTIONS RECEIVED FROM USEPA     DEVIATIONS     VISITORS (NAMES & TITLES)	A. TO STA., FOREMAN)	
6. EQUIPMENT 7. LUNCH MEETING COMMENTS: 8. UNUSUAL EVENTS (FIRE, FLOOD, STORM, LABOR 9. REMARKS:	R DISPUTES, ETC.)	
1.a) sediment scripting	al Ref	2-2
b) clam & shrip samp	ling at Re	f 2-2
		ę
IF ADDITIONAL SPACE IS REQUIRED, Cher	des Menzie	10/9/99 TURE OF PREPARER / DATE
TRANSMITTED TO WESTERN 2/11/99 12/5	,	

9/11/99 12

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			DATE 1///749_	
PROJECT NAME Doad Cook	Suga Area I F	ROJECT LOCATION	Souget/Caho	Lo, IIL
WEATHER	PRECIPITATION	Showers	TEMPERATURE	± 30°F
NUMBER OF HOURS WORKED	<u>.36</u> N	IUMBER OF EMPLOYE	ES <u>3</u>	
1. ITEMS WORKED ON (ITEM NO		O STA. FOREMAN)		
2. INSTRUCTIONS RECEIVED FROM 3. INSTRUCTIONS RECEIVED FROM	M SOLUTIA			· · · · · · · · · · · · · · · · · · ·
4. DEVIATIONS	III GOLL A			
5. VISITORS (NAMES & TITLES)				
6 EQUIPMENT	<del>                                     </del>			
7. LUNCH MEETING COMMENTS: 8. UNUSUAL EVENTS (FIRE, FLOC	D STORM LABOR DE	PUTES ETC)	··	<del></del>
9. REMARKS:	D. OTOTAL CASON DA			
			1,04	
1. Fishing in Borrow Pil				12 moully
a nord	7 10 WYONE	du Dont - We o		the bass from
a				You Piz
3, none - However, we	had a discuss		C Kamper of 4	pc/04_
- regarding une of		vere dead at +	time of collecte	Me No
1etinitive ble ci sia	1 was man	<del></del>	<del></del>	
H, now				
- modil				
5, north	<del></del>			<del></del>
le seines and dip nets			<u> </u>	
				<del></del>
7. None		<del></del>		
9, non		<del></del>		
*:				
9. The water level is		BOYVOW PIT to	an in October	Esta
are deal or alyang	due to con	with when	<del></del>	<del></del>
Hundredo of Fish we	e cought in	seine in both	locationo, Na	re of fish
cought in saint in Bo	rring Af were	largement	h on white be	200
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Grent westen	12199 HM1 0-	722		
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			- L	
	unen K	Chair a G	ste/ Kartragio ?	7.1. 1.1.1
IF ADDITIONAL SPACE IS REQU RECORD ON REVERSE SID	E F	PRINTED NAME / SIGN	ATURE OF PREPARER	DATE OF

1/STLOUIS/DIVISION/ADMIN\1999/WORKLOG WPD

DATE 11/2/99
PROJECT NAME Doad Could Sauget Area PROJECT LOCATION Sauget Cabotia, Ill.  WEATHER
WEATHER _ CLEAN PRECIPITATION NONE TEMPERATURE 30-YO'S F
NUMBER OF HOURS WORKED NUMBER OF EMPLOYEES
1. ITEMS WORKED ON (ITEM NO., DESCRIPTION, STA. TO STA., FOREMAN) 2. INSTRUCTIONS RECEIVED FROM SOLUTIA 3. INSTRUCTIONS RECEIVED FROM USEPA 4. DEVIATIONS 5. VISITORS (NAMES & TITLES)
6. EQUIPMENT
7. LUNCH MEETING COMMENTS: 8. UNUSUAL EVENTS (FIRE, FLOOD, STORM, LABOR DISPUTES, ETC.) 9. REMARKS:
1. Collected fich from Reference Aven 2-2 (Pond). 3 langements Bass, 4+ crapps Reducted to bowoupt, collected a langemouth bass
a. nord
3. NONE
y, nort
5. Exic Kemper of weston observed fishing at beforeme tive a =
6, seines, dip nets, ion beal
7. no10
8. narl
a large mouth bass.
Giren to he, for 11/3/99 0735 KdV
IF ADDITIONAL SPACE IS REQUIRED, RECORD ON REVERSE SIDE PRINTED NAME I SIGNATURE OF PREPAREN DATE

INSTRUCTION SIGNADMENT THE WORKLOG WITH

DATE 11/3/99

PROJECT NAME Dial Cont	- Sauget Aveat	PROJECT LOCATION	Suget/Cahat	a, III
WEATHER CLEM	PRECIPITATIO	· · · · · · · · · · · · · · · · · · ·	TEMPERATURE	50°F
NUMBER OF HOURS WORKED		NUMBER OF EMPLOYE	ES	
1. ITEMS WORKED ON (ITEM N 2. INSTRUCTIONS RECEIVED F		TO STA. FOREMAN)		<del></del>
3. INSTRUCTIONS RECEIVED F				<del>                                     </del>
4. DEVIATIONS				
5. VISITORS (NAMES & TITLES)	<u> </u>			<del> </del>
6. EQUIPMENT 7. LUNCH MEETING COMMENT	S:	<del></del>		<del> </del>
8. UNUSUAL EVENTS (FIRE, FL		DISPUTES, ETC.)		
9. REMARKS:				
I Collected larger	north hans ha	m ROLYDU D.+	<u> </u>	<del>                                     </del>
TO RECEIPT TO STATE OF THE STAT	7-4-0-1 (1600 47)			1
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3. norv	<del></del>			<b></b>
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				The same and the s
IF ADDITIONAL SPACE IS RE	QUIRED.	Katherine Foan	My Holhinge A	brit
RECORD ON REVERSE		PRINTED NAME / SIGN	ATURE OF PREPARER	DATE

Work Forecast for the day week: Weck of Oct 4 12 98 Date: Oct 1 1989
Project Name: Sauget Avan I Project Location: Dead Creck, Barre Company Name: Menzic - Cura Ref. Avan
Company Name: Menzic - Cura Ret. Aug
1. List Work Items and Locations Scheduled for Next Day/Week:
During this work we will and the main suppling event for the ecological work.
This work is described in:
Menzie - Chra QAPP Section 4.2.2
During this week we will:
a) collect sediment triad scomples
5) collect sucile/enverts for trasme ? Chalzeis
c) collect fish far hisue chelysis
d) collect plants for tossue analysis
e) collect every fish for trisme chelysis
Simple locations are described in the
Scaple locations one described in the recouncissance report submitted funition on September 24, 1999.
Sibmitted to wester 10/1/99 9:03 am
Charles Menzie / Charles / 10/1/89
If ADDITONAL SPACE IS REQUIRED, Name/Signature/Date of Preparer RECORD ON REVERSE SIDE

Work Forecast for the day week: 10/4/99 Date: 10/4/99
Project Name: Solution Area I Project Location: Decl Creek
Company Name: Meyzie - Cura
1. List Work Items and Locations Scheduled for Next Day/Week:
Our goels + objectives for ledy are:
1. set organized
Z. scaple all ecological entities in Creek
segments C + D
1. get organized  2. sample all ecological entities in Creek  segments C + D  3. sample sediments in creek sogments C+D,
16 that the subject to the subject to
15 we are festen then entrepeted we will begin sumpling in E
begin scaping in
Samples will include:
Semples will include: sediments (for chemistry)
(-direct (for toxicit)
fish tissues (if excileble)
Fish tisches (it exciteble)
(nyorts (if excilete)
plants (if everlebb)
plants (Tr evericity)
-
Given to westen 194/19 ofiso an Hay
·
Charles Menzie Charles Menzie 10/3/8

RECORD ON REVERSE SIDE

Work Forecast for the day/week: 10/5/99 Date: 10/5/99
Project Name: Solution Arca I Project Location: Dead Creek
Company Name: Menzie Cover
1. List Work Items and Locations Scheduled for Next Day/Week:
We will continue trical + ecological surpling. Goods for scupling include segments B+E chal site M.  We will also place that lines  in Barrow Pit Lake + possibly  the reference and J. We may  seine in Borrow Pit Cate. We  will attempt to set my fish treps.
Charles Mentie Elle 10/4/99  ITADDITONAL SPACE IS REQUIRED.  RECORD ON REVERSE SIDE  Name/Signature/Date of Preparer  Record on Reverse SIDE  Given to heston (0/4/99 20:45 ###

Work Forecast for the day week: 10/6/99 Date: 9 10/6/99
Project Name: School Avec I Project Location: Decl Creek
Company Name: Mentic Cura
1. List Work Items and Locations Scheduled for Next Day/Week:
a) continue ecological + seliment could
at Creek Segment E, Creek
Segment F, and the Barrew Pit
b) set fire
b) passibly set help overnigent at
b) possibly set note overnignat at the reference areas
Sibnified to weston 10/6/199 MM
<u> </u>
If ADDITIONAL SPACE IS REQUIRED, Name Signature Date of Preparer RECORD ON REVERSE SIDE

Work Forecast for the day week: 10/7/99 Date: 10/7/99
Project Name: Solutie Arra T Project Location: Dead Creat
Company Name: Menzie - Cura
1. List Work Items and Locations Scheduled for Next Day/Week:
Continue ecological /sediment sampling at:
a) Borny Pit Statin 2 BP. 2
b) Creek Seymant F
c) Previe Du Part
we will complete tishing effort in BP.
Given to we ton 10/7/99 0825 KM
If ADDITIONAL SPACE IS REQUIRED. Name/Signature/Date of Preparer

Work Forecast for the day week: 10/8/99 Date: 10/8/99
Project Name: Solution free T Project Location: Dead Creek/
Company Name: Menzie Cura
1. List Work Items and Locations Scheduled for Next Day/Week:
complete ecologish o sediment work
complete ecologish o sediment work
J
•
Given to wester 1º/8/99 0745 PAP -
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<u> </u>
Charles Menzie/elle / 10/8/99
If ADDITONAL SPACE IS REQUIRED, Name Signature Date of Freparer  BECORD ON REVERSE SIDE

Work Forecast for the	lay week:	10/9/9	9	Date:	10/8/99
Project Name: 5/4				ocation: Re	f Areas
Company Name:					<del></del>
1. List Work Items and	d Locations	Scheduled for	Next Day/We	ek:	
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If ADDITONAL SPACE I		Menzie /	Name/Sign		99 Irer
RECORD ON REVE			<b>-7</b>		

TRANSMITTED TO WESTER

Work Forecast for the day/week: 0 1/1 Date: 1/1/99
Project Name: Doed Crock Sauget Aven I Project Location: Sauget/Cahoka, 1711.
Company Name: Menzie-Cuna : Associatio
1. List Work Items and Locations Scheduled for Next Day/Week:
1. (ollected game fish (largemouth has a white bass) from paraps Pit and Ref. Pands to make complete Bo sample MOS.
2. Collect exapple from Ref Havea 2 to make complete Sample 105.
3. Pick up brown bullheads and crappel from Borrow Pit and Reference Ponds to augment if available to augment Samples calletted previously.
If ADDITONAL SPACE IS REQUIRED, RECORD ON REVERSE SIDE  Katheine Franty   Katheine Oxfogets Name/Signature/Dist of Preparer 1/1/99
Given to messon 1/1/29 0750 HM

Work Forecast for the day week:	1/1/99 Date: 1//1/99
Project Name: Dead Check Cauge	et Neas Project Location: Sauget / Cahokia, TV
Company Name: Menzie - Cus	
1. List Work Items and Locations Scho	eduled for Next Day/Week:
	ow p. t and reference ponds
3, electroshock in box	row Pit (and By lands if time allows).
:	
1	
	3
If ADDITONAL SPACE IS REQUIRED, RECORD ON REVERSE SIDE	Katherine Rogarts Hathuis adoparts / Name Stantural Date of Preparer

Given to wester "/1199 0750 - 1001

# Ø 043

# WORK FORECAST

Work Forecast for the day/week: 11/a/99 Date: 11/a/99	•
Project Name: Dead Creek / Sauget Avan   Project Location: Sauget/Cahokia, I	- 
Company Name: Nonty-Cur & Associate	
1. List Work Items and Locations Scheduled for Next Day/Week: 6255  (1) Collect fish - at least 3 langemouth; and 4 crapper than Reference Aveg 2	
Sovou) Pit.	
1	
Given to mester 1/2/99 HAP 0730.	٠.
Katherine Fagante, Kethung Hogart 11/	160

IF ADDITONAL SPACE IS REQUIRED, RECORD ON REVERSE SIDE

Name/Signature Date of Preparer

# WORK FORECAST

Work Forecast for the	week: _	11/3/99		Date: 11/3/99	<u>.                                    </u>
Project Name: Nead		, ,	Project Location	on: Saugot/Col	notin, III
Company Name: Mo	nzie-Cu	na · Associ	ates		na na projektiva. <del>Taran</del>
1. List Work Items an Collect one la				row At.	· · · · · · · · · · · · · · · · · · ·
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IFADDITONAL SPACE D	S REQUIRED RSE SIDE	Kathe	vine Fogant Name/Siggature/I	te / Kothwid (	rtogut/"

CONDUCTED BY / COMPANY KOH	oun Foga	te / Menzi-Cura	DATE 10/9/	79
PROJECT NAME Souget Avea	•	PROJECT LOCATION	ا می د	
WEATHER OLINGAST	PRECIPITATIO	N NOME	TEMPERATUR	RE 45 et M
NUMBER OF HOURS WORKED		NUMBER OF EMPLOYEE	s <u>8</u>	
1. SCHEDULED WORK: 2. REFERENCES TO APPROPRIATE 3. HEALTH AND SAFETY ISSUES WI 4. SPECIFIC HEALTH AND SAFETY ISSUES COMMENTS: 5. COMMENTS:	TH SCHEDULED W	ORK:		
Sample sediment and				ly begin
2. Ecological RISK ASSISS	ment axer.	Sections 4.3, 4.4,	4.5,4.6, 4.7,	4. R and HAS;
3. Working in Contamina Seriment by use of app Sploshing is an issue become of Slips, trips falls - es,	enapriale PA	E-wadish, gra	ors, satisfy g	
beware of poison is	vy			<u> </u>
4 mont 5, nord				
ATTENDANCE:	SMBI OVEE BION	ATION	001151157	
EMPLOYEE NAME (print)	EMPLOYEE SIGN		Menzio - Cu	
Ken Cerre to	The Cer	next .	MANERICK -C	<u> </u>
Pen Amas	Bayer		Muzu-Cun	
Susanne Hoeppher	Some Horn	m	Mentie-Cura	<u> </u>
MAKE MAKIN STEVEN BROOMEN	The al		REWitin.	
Alu I Con V	Fral)			<u> </u>
Aland Cark	ADIOEL S	<del></del>		<u> </u>
KUNDER T PENT	Just To	7	colution	<u> </u>
Chila Menzie	Wed &		M(A	
	·			<u>,                                      </u>
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				<u> </u>
IF ADDITIONAL SPACE IS REQUIR RECORD ON REVERSE SIDE	ED,	PRINTED NAME / SIG		HOLDAN IRER ()
		10/4/99	DATE	<u>.</u>
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I ISTLOUISIDIVISIONADMIMI 1999 SAFLOG WPD

		DATE 10/5/99
CONDUCTED BY / COMPANY : Mey zu - Cura		
PROJECT NAME Souget Avon E	PROJECT LOCATION	Deal Creck
4.4.4	ION NOVE	TEMPERATURE
NUMBER OF HOURS WORKED	NUMBER OF EMPLOYEE	s <u>7</u>
1. SCHEDULED WORK: 2. REFERENCES TO APPROPRIATE SECTION OF FS 3. HEALTH AND SAFETY ISSUES WITH SCHEDULE 4. SPECIFIC HEALTH AND SAFETY ISSUES REQUIR 5. COMMENTS:  (1) So digneral and Both Common Logicus  (1) So digneral and Both Common Logicus  (2) So digneral and Both Common Logicus  (3) So digneral and Both Common Logicus  (4) So digneral and Both Common Logicus  (5) So digneral and Both Common Logicus  (6) So digneral and Both Common Logicus  (6) So digneral and Both Common Logicus  (7) So digneral and Both Common Logicus  (7) So digneral and Both Logicus  (8) So digneral and Both Logicus  (9) So digneral and Both Logicus  (1) So digneral and Both Logicus  (1) So digneral and Both Logicus  (1) So digneral and Both Logicus  (1) So digneral and Both Logicus  (1) So digneral and Both Logicus  (1) So digneral and Both Logicus  (1) So digneral and Both Logicus  (1) So digneral and Both Logicus  (1) So digneral and Both Logicus  (1) So digneral and Both Logicus  (1) So digneral and Both Logicus  (2) So digneral and Both Logicus  (3) So digneral and Both Logicus  (4) So digneral and Both Logicus  (4) So digneral and Both Logicus  (5) So digneral and Both Logicus  (6) So digneral and Both Logicus  (6) So digneral and Both Logicus  (6) So digneral and Both Logicus  (6) So digneral and Both Logicus  (6) So digneral and Both Logicus  (6) So digneral and Both Logicus  (6) So digneral and Both Logicus  (6) So digneral and Both Logicus  (6) So digneral and Both Logicus  (6) So digneral and Both Logicus  (6) So digneral and Both Logicus  (6) So digneral and Both Logicus  (6) So digneral and Both Logicus  (6) So digneral and Both Logicus  (7) So digneral and Both Logicus  (7) So digneral and Both Logicus  (7) So digneral and Both Logicus  (7) So digneral and Both Logicus  (8) So digneral and Both Logicus  (8) So digneral and Both Logicus  (8) So digneral and Both Logicus  (8) So digneral and Both Logicus  (8) So digneral and Both Logicus  (8) So digneral and Both Logicus  (8) So digneral and Both Logicus  (8) So digneral an	D WORK; ING ATTENTION:	IM Bearin to Jama in
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Avoid contact with contaminated level D waters a safety alusted a contaminated in the safety alusted a safety a s	loves quoid get tang	
(3) non		
ATTENDANCE: EMPLOYEE NAME (print) EMPLOYEE SI		COMPANY
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Sea Ames Sulfur		PEF WESTON
E Vena		of whiten
Susanno Hoeppner signa Ho	Shur	MCA
Doig levin		MCA
Chevier Menzie		mça
timber stern luly		50/-44
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Green to wester 10/5/99 Kg		
IF ADDITIONAL SPACE IS REQUIRED, RECORD ON REVERSE SIDE	Kathevine Foam PRINTED NAMES SIG	ty Kather Atty
·	10/5/99	
	ι /	DATE

	DATE 10/6/99
CONDUCTED BY / COMPANY: May 21 - Cura	
PROJECT NAME Sauget Avea I PROJECT LOCATI	ION
WEATHER Class Sunny PRECIPITATION NO	TEMPERATURE FYO'F
NUMBER OF HOURS WORKED NUMBER OF EMP	LOYEES
1. SCHEDULED WORK:	
2. REFERENCES TO APPROPRIATE SECTION OF FSP & HASP: 3. HEALTH AND SAFETY ISSUES WITH SCHEDULED WORK:	
4. SPECIFIC HEALTH AND SAFETY ISSUES REQUIRING ATTENTION:	
5. COMMENTS:	
(1) settle (o) but sediment and biota samples from E	n the Bornow Pit and Creek
à Erclogicus wantiplan GAPP Section H, Ecolog.	ind was the HACP
3. Avoid sediment contamination, Godified land	D-waders, gloves, solety grasse
- Practice Boat safety - do not careed boat capacity	- wear life jackts
Bological hazards - prison wy cutish spire	etc.
Sign, trip, tall hazards	
However Life Jackets in Boat	
(S) Non!	
ATTENDANCE:	
EMPLOYEE NAME (print) EMPLOYEE SIGNATURE	COMPANY
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MARKAWAKIAN Waik O-	MA
Sed Hours Buly	MCA -
Susanne Hoeppner Susanne Horganso	MCA -
VOSEPH W. PEZEY	M(A
VOIEFH W. PERZE	2 2 2
GIVIEN TO WESTON 10/6 0829 M	7
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	-
10/6/19	DATE

C \Sauget\OBG Forma\SAFLOG WPD

CONDUCTED BY / COMPANY : / COMPANY	ie-Cua		DATE 10/7/99
PROJECT NAME Sauget Aver		PROJECT LOCATION	Dead Creek
WEATHER clean		on none	TEMPERATURE 50°F at
NUMBER OF HOURS WORKED		NUMBER OF EMPLOYEE	
SCHEDULED WORK:     REFERENCES TO APPROPRIATE S     HEALTH AND SAFETY ISSUES WI     SPECIFIC HEALTH AND SAFETY IS     COMMENTS:	TH SCHEDULED	WORK:	
(1) Sediment and 0,0th san	upling in	borrow pit and	So tronf
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3 contact with contam	nated sed	iment-auria	of use of woders,
	actetic	avad ranged une	s: don't overload
V	, . ,	Snapping tunt	eg, calfish spines
trop slip fall to rando		, , ,	
(4) Use life ackets in 60	at		7
(5) Non			
ATTENDANCE:			<b>5</b>
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JOSEPH W. PERRY		Todylor .	MCA -
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IF ADDITIONAL SPACE IS REQUIRE RECORD ON REVERSE SIDE		Katherine Foga PRINTED NAME LSIG	Ay / Kodris / Hoger &
			DATE -

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			DATE 10/8/99
CONDUCTED BY / COMPANY : Ma	rzee-leur		
CONDUCTED BY / COMPANY : Man	I- Bead Creek	PROJECT LOCATION	
WEATHER demp	PRECIPITATIO	ON rain (light)	TEMPERATURE \$\(\frac{\psi}{F}\)
NUMBER OF HOURS WORKED		NUMBER OF EMPLOYE	ES
1. SCHEDULED WORK: 2. REFERENCES TO APPROPRIA 3. HEALTH AND SAFETY ISSUES 4. SPECIFIC HEALTH AND SAFET 5. COMMENTS:	WITH SCHEDULED	WORK;	
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aver outraine in	garas- po	son rog, una	Array areas 144
(4) MON			
ATTENDANCE:	EMPLOYEE SIGI	NATURE	COMPANY
EMPLOYEE NAME (print)  WARK AVAKON	Allen 2	VATURE	McA
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IF ADDITIONAL SPACE IS REQU RECORD ON REVERSE SID		Cathering Form PRINTED NAME USI 101849	GNATURE OF PREPARER
	<del></del>	1771	DATE

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CONDUCTED BY / COMPANY	r. Nenzie-Cura		DATE 70/4/49
PROJECT NAME Sound		PROJECT LOCATION	Sauget/Cahatia
WEATHER DUENCEST	DRECIDITATIO	ON min in agala.	TEMPERATURE 65 181
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NUMBER OF HOURS WORK	ED	NUMBER OF EMPLOYEES	S6
1. SCHEDULED WORK:			
2. REFERENCES TO APPRO			
4. SPECIFIC HEALTH AND S			
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2) Section 4040	F ecological was	KOIM OFFP; HASP	of ecological wontplan
3) avoid contact	with sedimen	<i>Ŧ</i>	
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y) wear we jack	eto on boat		
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<i>y</i>	<del>1</del>		
ATTENDANCE: EMPLOYEE NAME (print)	EMPLOYEE SIG	NATIOE	COMPANY
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The Austra	- 701		MES
Dag Lenn	- 2	Gene	ma
Susanne Hoeppner	Sugarrely	Konport	McA
Cherles Menze		all.	mca
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			<u> </u>
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RECORD ON REVER		PRINTED NAME SIG	NATURE OF PREPARER /
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9/11/99 1215	- <del>-</del> <del></del>	10/4/14 D	ATE -
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IF ADDITIONAL SPACE IS REQUIRED, RECORD ON REVERSE SIDE

PRINTED NAME / SCHÄTURE OF PREPARERS

JUL 199

DATE

EISTLOUISDIVINONADMINAISSASALOG VID

CONDUCTED BY / COMPANY : Karthering Fog	arte Menzu-Cura	DATE 11/0/99
PROJECT NAME Dood Creek/Souget Area	Z PROJECT LOCATION	Sauget/Cahokia, Ill.
	ATION hare	
NUMBER OF HOURS WORKED	NUMBER OF EMPLOY	EES <u>3</u>
1. SCHEDULED WORK: 2. REFERENCES TO APPROPRIATE SECTION OF 3. HEALTH AND SAFETY ISSUES WITH SCHEDUL 4. SPECIFIC HEALTH AND SAFETY ISSUES REQU 5. COMMENTS:  1. Fig. (declin in second for 2. Section 4.7 of les risk a	ED WORK: IRING ATTENTION:  Levenue Avea 2 and	
3. Bonting Safely - wear life ju	ackets in foot	
Trip slip fall hazards.		
Avoid contact with contamin	ated Sediment	
Avoid histogreat hazands; e.g	pason ivy	
4, NON 5. NON		
ATTENDANCE: EMPLOYEE NAME (print)  FMPLOYEE  PLANTIP DUPLE  PLANTIP  Remper 7 Perry  Light State	SIGNATURE	COMPANY  ABSOLUTION  SOLUTION  Mausagele  REU
Given to wester "/2/99 KM	6730	
IF ADDITIONAL SPACE IS REQUIRED, RECORD ON REVERSE SIDE	Katherine Fogarty PRINTED NAME A	Contractor O Hogganter S

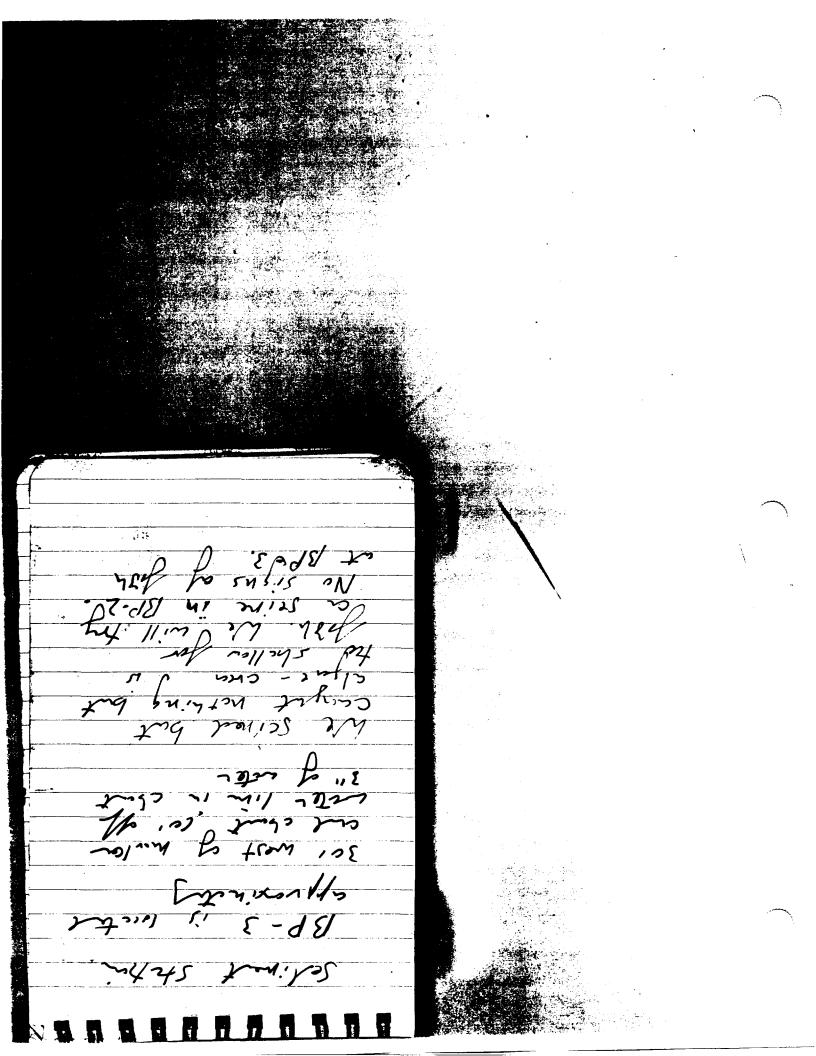
PROJECT NAME DOOL CONTACT	zie-Cura		DATE 1/3/99	· ·
PROJECT NAME DOOL Creek 15	Mart AVMI PR	OJECT LOCATION	- Sauget/CahoKid	1. II
WEATHER			TEMPERATURE	
NUMBER OF HOURS WORKED	NU	IMBER OF EMPLOYEE	s <u>3</u>	
1. SCHEDULED WORK: 2. REFERENCES TO APPROPRIATI 3. HEALTH AND SAFETY ISSUES W 4. SPECIFIC HEALTH AND SAFETY 5. COMMENTS: 1. ("DUECHUM OF FISH WO  R. ECOLOGICAL RICK HELESTY	TH SCHEDULED WOR ISSUES REQUIRING A M HA BOTTOM PLT.	K: ITENTION:	ad vsrassessment	THAST
Aund contact with		in the boot		
ATTENDANCE: EMPLOYEE NAME (print)  Day 3. L.V (N  Fill Day  Vinited 2 Person	EMPLOYEE SIGNATION OF THE PROPERTY OF THE PROP	URE	COMPANY  CMA  RFW  PCO  Soldta  MANGERICE	
Given times		5 10		
IF ADDITIONAL SPACE IS REQUIRED IN RECORD ON REVERSE SIDE		PRINTED NAME / SIG	NATURE OF PREPAR	by A
E-STLOUISDIVISION/ADMINI999/SAFLOG #PD		<b>1</b> • <b>1</b>	DATE •	

### 3.26.4.4 Field Notes

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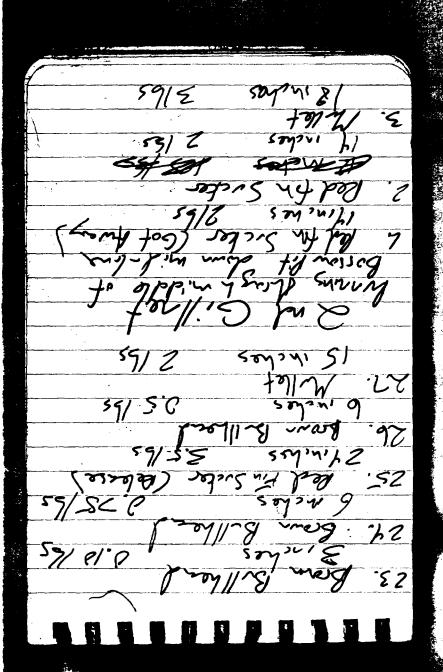
1. Red Fin Sucker ? Share

1. Red Fin Sucker?

17 inches, 2 16s. 2. Red Fin Sucker? 18 inches 2/65 3. led Fit Sreker? (Release) 8 moles \$ 0.5/65 4. Mullet 12 inches

Coer Juches the Bess 2/65 1.5/65 21/5 

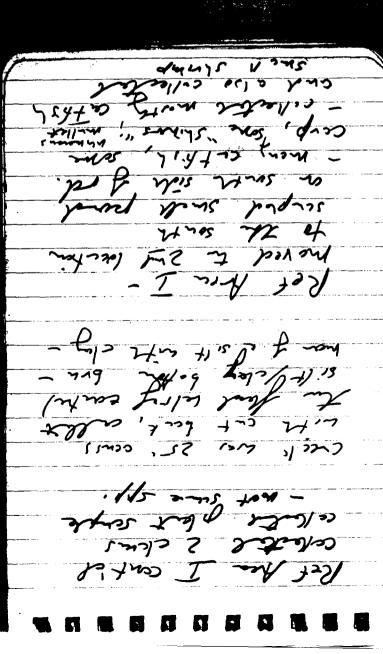
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10-8-99 Refireals 9:30 am Section

after rainfall last night, the
dried out section to the right
of the flood gain pump (standing
on top of the lever) has small
puddles and wet sections in
it - took sediment samples
in those; sediments are
lumpy with lots of gry clay

Benchic invert. community samples taken further to the left of the Flood gate in permanent (3) water-covered section of Prairie du Pont Crek

plant cover scarce around the edges; small plants with cockleburs (seeks that cling to

shorting - fairly abundant by 11:30 am sampled by scine for more 000 samples the cover about 60° 7 OKICASI 6bon Ref. Amea Section 2 most abundan (-8 ren

- sed-chem. taken at close left shore of pool (water-chem. samples taken at opposite side of same end)

benthic community samples
small-most sodiment is clay
(solid) and supports no
further biota

no emergent plents observed, several meters of mud separate shoreline vegetation from pool (i.e. not found: plant species sampled at other sampling locations)

# 

15:30 - 5.62 h Sold note 15:30 - 5.62 h Sold note 2 15.0 - 5 course & berown 15:0 - 5 course

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## REF 2-Z

12 MULLET 14" 2165 4 CARP 14" 256 lbs 4 GAR 18" 1 GAR 36"+ 716s

Sizzand - n 2-3" in Ishad length Missin cause in Length seine: 40

1.m. bass - 4 leger fish

Coppil - 2
Forage Fish (juvenile
1mb + coppie) # 48
2-3"

12 hr dest: 6

E; Mon fung OS: wanp

S:9742

5hihor (toothood): 1

1-15" 1-15" 2-26"

82 2/2 2/20M



10/4/99

Creek Seckion D-1

10:45

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1 ot sow - manbord sute

all \$ 4 mo gren sturt 18th bub wornin Sine yulded 100'5 of fundy 0150 minnows duters tot 0150 may tod polos 8 Sp. cattish halo J-800107 9-10 extensing = 1 chem + 17 ovole 1-J-XCLA TISS - D-1 = 6000 - yellaw the "bustereuth" species - Moury 1 ) are 510 e jan ea マトロ 1-1-0 mm079 De MU Sedimont 1 W 019 SI POUS AUS **퐇-**Q -SSI19

1210 D-2 snails for composity Sed a Jans Toxicity BTOXA a bags for plands PTISS-2 added fed chem + Toc+ gy 5/20 at this. BCOMM - D - 2-1 2-2 a-3 Lunds D-3 with 13:55 MAVALIM J. Perry 5. Moderay wester D. Cevin K ROMA

most Lath dead cathieth 6" dead

C-2 K loweth BAMOS SHOEPMW

sed single

Snails
PT165 2 60gp
Sed chem
BTDX 2 jurs
DOMM D-3-1
D-3-2
D-3-3

1420 C-3 C. Menzie - see for notu Hime etz. tuis sta

C-3 is close to de wet mud - no water fish kill-bad smell-due to lack of water

ordetted sed for chem DTOX C-3 2 gal jours orom C-1 C-3 C-3

monsks for bear on buntuin sample scooped musig ( 06-6-5 (1-8-2) x 07 , 602 aton nortate Klorust note 600l for Puddll, Kenning fish wet mul w/ very shallow herros - - souros giens 7-775-5549 S Harphan K words sound C-3 02:51

red buckets benthin c-2
16:15
C-1 NO snaids
PTISS-C-1 K.C.

BLOMM -1
-2
-3
D.Levin

Note: Plants: Fish
extra washing when
done

10/5/99 Greek Lation B 8:00 AM Helped OBG codo equipment rinoat

16 cotul 15-2 bg Tae Perus Soction B
Soldier B
BA SH Jac
Police Detril
C. Menrie
EPS

1000 - go ser dun total 284 snails is Devin-BTO x - 12 - 1 plants 6-1-3 Chen zie to 13-1 at 13-1 BUMM 5h:6

9:00 B-3

sed chum + Dc. gy s/2

B-3-1 B ONLY

3-3

5-3

8-3

8-3

5-3

6 Shind B

1-2 Standing water

977555555

1-2' Standing water Submerged against veg cloyey sedol- sipper Hovery & Kulldern Slynd shin from selv

B-1 continued stream bed dry ±1" standing water 3' width of water set original location but 100' S of water station

smils, tags, dancel fly upuphs

clayer sitt w/interbedded sand layers 665erbed smiled al sheen on seds 1245 Us at Evic Cemper at B-3 collected smalls BEOMM B-1-1

9

1340 Past Lunch MAratian & Dlevin Begun M

1410 Kegady, Chearie

Charles mud w/ sand snails snails to show yed veg plants gun suntish seine yedds gun suntish hoor observed

6-3-4018 GOTESTA LE child putalled Carto biles peter.
No Snails (! large snaid)
No Fish. Standing with the 18 the staly MOSTERADO GOD I Page tou thouse a sight wet nook Bed is & dry - no sanding MAZOR 6-3 montres down

MAOS 9 1-3 Areany Areany Areany 1-1-3-4076 6-1-3 1-1-3-MMOd 8-1-3 8-1-3 8-1-3 8-1-3 Manue; by base Manue in alone mulo Mynnos in alone mulo Mynnos in alone mulo

F-20

Sanding while it this 10 cetters No very soft mud No very set the sand Species

the regard of the sound and the first on sound of the first on in the text of the things on the text of the things on the text of the text

Domested - 10 fish on anyly one sufficient area - may

with overhanging true) duck word in Ving Location is knowned E-2 from recon Not culved - renamed E 13 mout E-mo snails no Esty E-BTOX E-3 REDUCENT TOCTOR 5. ZE MS/MSD on sed orc BLOMM E-37 モーヨーコ E-3-3 Steve Brodman - 45173 police other Kimber Visits

EPlants - Need to sewashed

19 AM and then Frozen

Done 19/7/99

Borrow At

K. Cerreto Zoish

D. Cerro Zoish

M. Arakian

B. Ames

J Penny

S. Horpmen

K. Kormen

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Clamb Collected

# AAAUUUUU

Clayed cohomic mud -some a formation of a magast regularized as magast few some smarls F-3 at 15 y 5 corrected very some some starts

A160 colleted BP-3 claims

water covered widuckwood
1-3" if water
under poplars/aspin
plants on all side
out tracks dog tracks
shimle raccoon tracks
small from 5.

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ting fish observed-= 1/2" to 1" long return w/ D net?

1610 F2 - 2 avong level -mough soybean field to Creens

Creek to oide up to 1.5' water Soft mud tofon poplars (cotton wood?) this is r parrow your many 5 mall flows bird deev tracks no snails obs.

Sylvery Ley amy - bun the way moderate of the of the 1430 by cash HS 110 th HAY
1-8-131 hb/0/01 Cast Aquestich re beder. Saberhang sarupnast

Sed to 1 & chein (chein d Se gite 1. 14 July 10.4.7 Township. Alberta. 

Collected Shrimp approx. biomass:

Ref 2-2 (Tond)

~80g

Ref 2-1 ((rek)

~60g

Refl - 1+2 (Prairie du Pont (rock)

~ 280g= PBC 1-2 (Rcf1) ~ 20-40g 11/1/99 K. Fogarle D. Cevin P. Downey from last site visit collected ( seine dipret Water depth less than I Carp, "mult " etc. Photos 27-16 low water level - dead fish correl somed 1x \$ no LMB hawto Collected 2 LMB like 1410 CPID COLUM

Acres of results of the or

Wines with operated

Silver carp, etc.
few simplifish cosmond

\* silver carp way assund not

silver carp way a sund not

silver carp way a sund not

served to the 2x covering to 3/3 of water 60de to 3

vegetation builded lack-

11/2/99 K. Fogusto Dierra, P. Downie Red Avea 2-2 Rost of Phyton
Waln is was down on-site 10.30 - Eve Kemper Western small shrimp observed BIMB - & Cruppie 1 bullheaf - Met My Garlet - owner observed, publication, shood 4050 1530-lumber boat in Evil Kemper departer Callerded

# 14:00 Served 36 times Collected 2LMB a' 100'S of fish per serve mostly silver carp-aiso Gener carp, bullheado, etc.



56 (5.7 Sect 38. 35 07.444/6 W Weigh Point is 1911/1

### 3.27 Benthic Macroinvertebrates for Community Evaluation

### 3.27.1 Rationale/Design

The analysis of benthic macroinvertebrate community structure will be used to support the assessment of possible effects on benthic invertebrates. The samples will be analyzed for taxa richness, abundance, percent dominant taxa, and community composition.

### 3.27.2 QA/QC Procedures

Three samples were collected from each location and analyzed separately to provide a measure of within-station variability. Given this sampling scheme, field duplicates were not necessary. The remaining types of QA/QC samples (equipment blanks, trip blanks, and MS/MSD samples) are not appropriate for benthic macroinvertebrate community analysis.

### 3.27.3 Field Procedures

Prior to beginning fieldwork, Preparatory Inspection Meetings were held that were attended by a representative of each of the interested parties (Section 3.26.4).

Samples for benthic macroinvertebrate community analysis were collected at the same times and locations as the toxicity bioassay and chemical analysis samples using a tall Eckman grab. The contents of each grab were emptied into a bucket and then sieved in a 0.5-mm sieve. The material remaining on the sieve (sediment, detritus, plant material and organisms) was placed in a wide-mouth plastic jar and preserved with 70% isopropyl alcohol.

Chain-of-custody forms were completed for each sample. Samples were sent to Aquatec Biological Sciences in South Burlington, Vermont at the end of the main sampling event.

### 3.27.4 Documentation

Table 3.27.4 lists the sample stations for benthic macroinvertebrate community samples. Figure 4 depicts the locations of the benthic macroinvertebrate community stations which were collocated with sediment chemistry and toxicity stations. The chain-of-custody forms are in Section 3.27.4.1.

The Daily Work Logs, Work Forecasts, and Safety Meeting Forms for the Main Sampling Event are in Section 3.26.4.3 and the field notes are in Section 3.26.4.4.

Table 3.27.4
List of Sample Locations and Dates for
Samples Collected for Benthic Community Analysis
Sauget Area I

Sample ID	Station	Date of Sample
COMM B-1-1	Creek Sector B-1	10/5/99
COMM B-1-2	Creek Sector B-1	10/5/99
COMM B-1-3	Creek Sector B-1	10/5/99
COMM B-2-1	Creek Sector B-2	10/5/99
COMM B-2-2	Creek Sector B-2	10/5/99
COMM B-2-3	Creek Sector B-2	10/5/99
COMM B-3-1	Creek Sector B-3	10/5/99
COMM B-3-2	Creek Sector B-3	10/5/99
COMM B-3-3	Creek Sector B-3	10/5/99
COMM M-1	Site M	10/5/99
COMM M-2	Site M	10/5/99
COMM M-3	Site M	10/5/99
COMM C-1-1	Creek Sector C-1	10/4/99
COMM C-1-2	Creek Sector C-1	10/4/99
COMM C-1-3	Creek Sector C-1	10/4/99
COMM C-2-1	Creek Sector C-2	10/4/99
COMM C-2-2	Creek Sector C-2	10/4/99
COMM C-2-3	Creek Sector C-2	10/4/99
COMM C-3-1	Creek Sector C-3	10/4/99
COMM C-3-2	Creek Sector C-3	10/4/99
COMM C-3-3	Creek Sector C-3	10/4/99
COMM D-1-1	Creek Sector D-1	10/4/99
COMM D-1-2	Creek Sector D-1	10/4/99
COMM D-1-3	Creek Sector D-1	10/4/99
COMM D-2-1	Creek Sector D-2	10/4/99
COMM D-2-2	Creek Sector D-2	10/4/99
COMM D-2-3	Creek Sector D-2	10/4/99
COMM D-3-1	Creek Sector D-3	10/4/99
COMM D-3-2	Creek Sector D-3	10/4/99
COMM D-3-3	Creek Sector D-3	10/4/99
COMM E-1-1	Creek Sector E-1	10/6/99
COMM E-1-2	Creek Sector E-1	10/6/99
COMM E-1-3	Creek Sector E-1	10/6/99
COMM E-2-1	Creek Sector E-2	10/6/99
COMM E-2-2	Creek Sector E-2	10/6/99
COMM E-2-3	Creek Sector E-2	10/6/99
COMM E-3-1	Creek Sector E-3	10/6/99
COMM E-3-2	Creek Sector E-3	10/6/99
COMM E-3-3	Creek Sector E-3	10/6/99
COMM F-1-1	Creek Sector F-1	10/7/99
COMM F-1-2	Creek Sector F-1	10/7/99
COMM F-1-3	Creek Sector F-1	10/7/99
COMM F-2-1	Creek Sector F-2	10/7/99
COMM F-2-2	Creek Sector F-2	10/7/99
COMM F-2-3	Creek Sector F-2	10/7/99
COMM F-3-1	Creek Sector F-3	10/7/99
COMM F-3-2	Creek Sector F-3	10/7/99
COMM F-3-3	Creek Sector F-3	10/7/99

Table 3.27.4
List of Sample Locations and Dates for
Samples Collected for Benthic Community Analysis
Sauget Area I

Sample ID	Station	Date of Sample
COMM BP-1-1	Borrow Pit 1	10/6/99
COMM BP-1-2	Borrow Pit 1	10/6/99
COMM BP-1-3	Borrow Pit 1	10/6/99
COMM BP-2-1	Borrow Pit 2	10/7/99
COMM BP-2-2	Borrow Pit 2	10/7/99
COMM BP-2-3	Borrow Pit 2	10/7/99
COMM BP-3-1	Borrow Pit 3	10/7/99
COMM BP-3-2	Borrow Pit 3	10/7/99
COMM BP-3-3	Borrow Pit 3	10/7/99
İ	Reference Area 1-1 (Old	
COMM PDC-1-1	Prairie DuPont Creek)	10/8/99
	Reference Area 1-1 (Old	
COMM PDC-1-2	Prairie DuPont Creek)	10/8/99
1	Reference Area 1-1 (Old	
COMM PDC-1-3	Prairie DuPont Creek)	10/8/99
1	Reference Area 1-2 (Old	
COMM PDC-2-1	Prarie DuPont Creek)	10/8/99
1	Reference Area 1-2 (Old	
COMM PDC-2-2	Prarie DuPont Creek)	10/8/99
	Reference Area 1-2 (Old	
COMM PDC-2-3	Prarie DuPont Creek)	10/8/99
	Reference Area 2-1 (Long	
COMM Ref2-1-1	Slash Creek)	10/8/99
	Reference Area 2-1 (Long	
COMM Ref2-1-2	Slash Creek)	10/8/99
	Reference Area 2-1 (Long	
COMM Ref2-1-3	Slash Creek)	10/8/99
COMM Ref2-2-1	Reference Area 2-2	10/8/99
COMM Ref2-2	Reference Area 2-2	10/8/99
COMM Ref2-3	Reference Area 2-2	10/8/99

### 3.27.4.1 Chain-of-Custody Forms

## CHAIN OF CUSTODY RECORD

Project No.   Project No.   Project No.   Project No.   Project No.   Project No.   Project No.   No. of   Courthouse Lane, Suite 2 CHELMSFORD, MA 01824    DATE: /U/9/89   Analyses Required   TEL: 978/453-4300 FAX: 978/453-726    SAMPLERS Mazie, Figury, Auction, Levin, Cerreto, Hoeppar, Amos, Perry   No. of   Sample 10   Date Comp. Grab Station Locations   No. of   Sample 10   Date Comp.   Grab Station Locations   No. of   Sample 10   Date Court Sector B-/   // Sample 10   No. of   Sample 10   No. of   Sample 10   No. of   Sample 10   No. of   Sample 10   No. of   Sample 10   No. of   Sample 10   No. of   Sample 10   No. of   Sample 10   No. of   Sample 10   No. of   No. of   No. of   Sample 10   No. of	<b>30</b>
DATE: 10/9 99  SAMPLERS Manzie, Figury, Aukin, Levin, (erreto, Hoeppar, Amos, Perry  SAMPLE 10 Date Comp. Grab Station Locations  Containers  NO. of Containers  NOTES  NO	
SAMPLERS Marzie, Fogarry, Austin, Levin, Cerreto, Huegprat, Amos, Perry  SAMPLEID Date Comp. Grab Station Locations  No. of Containers  No. of Con	
17 B-1-1 10/5 9:45 / Cseek Sector B-1 / / A// Reserved 1h B-1-2 10/5 9:45 / " / / 70 70 Isopropy/ B-1-3 10/5 14:10 / Cseek Sector B-2 / / Allohal  B-2-1 10/5 14:10 / " / / Allohal  B-2-2 10/5 14:10 / " / / B-3-1 10/5 9:30 / Cseek Sector B-3 / / B-3-2 10/5 9:30 / Cseek Sector B-3 / / B-3-2 10/5 9:30 / Cseek Sector B-3 / / B-3-2 10/5 9:30 / Sife M / / / M-2 10/5 13:40 / " / / / / / / / / / / / / / / / / /	
17 B-1-1 10/5 9:45 / Cseek Sector B-1 / / A// Reserved 1h B-1-2 10/5 9:45 / " / / 70 70 Isopropy/ B-1-3 10/5 14:10 / Cseek Sector B-2 / / Allohal  B-2-1 10/5 14:10 / " / / Allohal  B-2-2 10/5 14:10 / " / / B-3-1 10/5 9:30 / Cseek Sector B-3 / / B-3-2 10/5 9:30 / Cseek Sector B-3 / / B-3-2 10/5 9:30 / Cseek Sector B-3 / / B-3-2 10/5 9:30 / Sife M / / / M-2 10/5 13:40 / " / / / / / / / / / / / / / / / / /	
B-1-2 10/5 9:45 - "	
B-1-2 10/5 9:45 - "	
B-2-/ 10/5 14:10 / (seek Sector B-2 1 / B-2-2 10/5 14:10 / " ( / )  B-2-3 10/5 14:10 / " ( / )  B-3-1 10/5 9:00 / Creak Sector B-3 / " ( / )  B-3-2 10/5 9:00 / " ( / )  B-3-3 10/5 9:00 / " ( / )  B-3-3 10/5 9:00 / " ( / )  B-3-3 10/5 9:00 / " ( / )  B-3-3 10/5 9:00 / " ( / )  B-3-3 10/5 9:00 / " ( / )	
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B-2-3 10/5 14:10 / " ( / )  B-3-1 10/5 9:00 / Creak Sector B-3 / / "  B-3-2 10/5 9:00 / " ( / )  B-3-3 10/5 9:00 / " ( / )  M-/ 10/5 13:40 / Site M / / " ( / )  M-2 10/5 13:40 / " ( / )	
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B-3-2 10/5 9:00 - " / /	
14-1 10/5 13:40 / Site 14 / - 1 / -	
14-2 10/5 13:40 / " / /	
(-2-2 10/4 15:30 - Creek Sector C-2 / - Creek Sector C-3 / -	
F-3-3 10/47 10.45 / Creak Sector F-3 / / (Green Cooler)	
Relinquished By: (Signature)  Received By: (Signature)  Date Time Remarks:  Date 10/26/94 15:00  Date Time Remarks:	
Relinquished By: (Signature)  Date Time Received By (Signature)  Date Time Received By (Signature)	
Relinquished By: (Signature)  Date Time Received By: (Signature)  Date Time 69 Samples total	
Relinquished By: (Signature)  Date  Time Received By: (Signature)  Date  Date  Time Received By: (Signature)  Date  Time Received By: (Signature)  Date  Date  Date  Time Received By: (Signature)  Date	
Contact Person: Phi/ Downey  Phone: (802) 860-1638  B-Fand BP-> 9each PDC + Ref2 > 6 each M-> 3	

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DATE: 10/19/99				Analy	/ses Rec	quired	CHELMSFORD, MA 01824 TEL: 978/453-4300 FAX: 978/453-7260	
SAMPLERS MENZIC, FOSCIT, A	Lakian, Levin, Carr	reto,						TEE. 970/433-1200
Hoepprer, Amos, Perry	,			Sorth				
SAMPLE ID Date COME. Grab	Station Locations		No. of Containers	88	_			NOTES
M C-1-1 10/4 16:15 V	Creek Sector C-1		1	-				All preceived in 70%
C-1-2 10/4 16:15 V	•,			-				Isopopy ( Alcohol
C-1-3 10/4 16:15 V	1 5 1 7	<del></del>	1	-			<b> </b>	
C-2-1 10/4 15:30 -		-2		-			<b> </b>	
C-2-3 10/4 15:30 V	( )	<del></del>		ا سيا			<b> </b>	
(-3-1 10/4 14:20 L	Creek Sector C-		<del>                                     </del>				<b> </b>	
C-3-2 10/4 14:20 V	0-60 11	<del></del>	<del>                                     </del>	<u></u>				
	Reference Location	<u>x-1</u>	<del>                                     </del>				<del> </del>	
Ref2-1-3 10/8 14:30 -			<del></del>				<del> </del> -	
	Reference Location =	/						
Ros-2-2 10/4 10:30	11	<del></del>						
Ref · 2 - 3 10/9 10:30	••		1	-			<b></b> -	
PD(-1-1 10/8 9:30 W	Prisic DuPont Creek	-1	1	-			<u> </u>	
PDC-1-2 W/8 9:30 V	* *		/					
PDC-1-3 10/0 9:30 V	"		/					
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PDC-2-2 10/8 11:20 ~	11		/					
Relinquished By: (Signature)  Kenneth M Ent	10 (25 (99	Time	Received By:	(Signature)	E	10/26	Time 15:00	Remarks:
Relinquished By: (Signature)	Date	Time	Received By:	(Signature)		Date	Time	White Goler
Relinquished By: (Signature)	Date	Time	Received By:	(Signature)		Date	Time	
Laboratory: Aqualec	<u></u>		Phone:	802) 2	860 -	1638		
Contact Person	Downey							

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	Hoeppre	C, Ar	ws,	Perry	•			7 8	ļ		}	İ						
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DMM	PDC-2-3	10/8	11:20	-	Prarie Du Pont Cree	4-2	/	1				†	(In Whit	e Cooler)				
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		0/19	////								TEL: 978/453-4300 FAX: 978/453-7260	
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### 3.28 Invertebrate Collection for Tissue Analysis

#### 3.28.1 Rationale/Design

Macroinvertebrates were collected in each sector of Dead Creek, the Borrow Pit, and the reference locations for tissue analysis to assess possible effects on benthic invertebrates and the organisms that feed on them. Three different macroinvertebrates were sampled, clams, snails, and shrimp.

Prior to the reconnaissance survey and field sampling, crayfish were included among the organisms to be sampled for tissue analysis. It was assumed that crayfish would be present. During both the reconnaissance survey and the field sampling program, no crayfish were collected or observed in any of the sampling locations. Collection efforts included baited minnow traps and beach seining. Shrimp were sampled instead of crayfish for tissue analysis. Shrimp were selected as the best replacement for crayfish as they are both members of the same order, decapoda, and because shrimp were abundant in the areas where they occurred. The deviation log and memorandum describing this change is in Section 3.28.4.1.

### 3.28.2 QA/QC Procedures

Additional clams were taken from Station 1 in the Borrow Pit to provide a field duplicate and MS/MSD sample ((CLAMBP-1 COMP-01). Sample CLAMBP-3 COMP-01 from the Borrow Pit was split with USEPA representatives. Trip blanks are not necessary for tissue samples. The beach seines were not considered a quantifiable source of cross-contamination and washing all invertebrates sampled further reduced the possibility of cross-contamination. This eliminated the need for an equipment rinsate blank from the beach seines. The deviation log describing this decision is in Section 3.28.4.1.

#### 3.28.3 Field Procedures

Prior to beginning fieldwork, Preparatory Inspection Meetings were held that were attended by a representative of each of the interested parties (Section 3.26.4).

Snails (*Physella heterostropha*) were collected from creek sectors B, C, and D, the Old Prairie du Pont Creek reference area (reference area 1), and the Long Slash Creek reference area (reference area 2-1). Snails were collected by picking them by hand from the substrate. Clams (*Pyganodon grandis*) were collected by hand and beach seine and were found at the Borrow Pit, reference area 1, and reference area 2-2 (Photo 3.28.4.3.1). Clams were placed in a cooler full of site water and were allowed to depurate for 24 hours. This allows for a more accurate tissue analysis by reducing the amount of sediment in the gut. Shrimp (*Palaemonetes kadiakensis*) were collected by beach seine at the Borrow Pit and both reference locations (Photo 3.28.4.3.2). The total amount of tissue mass of shrimp collected from the Borrow Pit and reference areas was smaller than required for three samples from the Borrow Pit and two each from the two reference areas. Therefore, one composite sample was created for the Borrow Pit and one for each reference area. The deviation log for this decision is in Section 3.28.4.1. Biota samples were frozen on the day of collection (or after depuration in the case of clams). Samples were shipped frozen on dry ice to the laboratory for analysis.

#### 3.28.4 Documentation

Table 3.28.4 lists the locations where macroinvertebrates were sampled. The deviation logs for this task are in Section 3.28.4.1, photographs are in Section 3.28.4.2, and the chain-of-custody forms are in Section 3.28.4.3.

The Daily Work Logs, Work Forecasts, and Safety Meeting Forms for the Main Sampling Event are in Section 3.26.4.3 and the field notes are in Section 3.26.4.4.

#### Table 3.28.4 List of Invertebrate Sample Stations, Dates, and QA/QC Samples Sauget Area I

Invertebrate Type	Sample ID	Station	Chain of Custody ID	Date of Collection	Number of organisms or (weight in grams)	QA/QC Samples
Snails	SNCS-B COMP 1	Creek Sector B	BTISS-B	10/5/99	(75.3 g)	
	ĺ	Site M			None present	
	SNCS-C COMP 1	Creek Sector C	BTISS-C	10/4/99	(166 g)	
	SNCS-D COMP 1	Creek Sector D	BTISS-D	10/4/99	(233 g)	
		Creek Sector E			None present	
		Creek Sector F			None present	
		Borrow Pit		10/4/99	None present	
	SN REF1 COMP 1	Reference Area 1	<b>\</b>	10/8/99	(84.4 g)	ĺ
		(Old Prarie DuPont				
		Creek)	BTISS-PDC1+2			
	SN REF 2-1 COMP 1	Reference Area 2-1		10/8/99	(229.1 g)	
		(Long Slash Creek)	BTISS-Ref2-1		, ,	
		Reference Area 2-2			None present	
Clams	CLAMBP-1 COMP-01	Borrow Pit 1	CLAMBP-1	10/6/99	4	
	CLAMBP-1 COMP-02	Borrow Pit 1	CLAMBP-1	10/6/99	3	
	CLAMBP-1 COMP-03	Borrow Pit 1	CLAMBP-1	10/6/99	4	
	CLAMBP-2 COMP-01	Borrow Pit 2	CLAMBP-2	10/7/99	2	
	CLAMBP-3 COMP-01	Borrow Pit 3	CLAMBP-3	10/6/99	3	Split with Weston
	CLAMREF1 COMP-01	Reference Area 1-1	CLAM Ref-1-1	10/8/99	3	
		(Old Prarie DuPont				
		Creek)				
	CLAMREF2-2 COMP-01		CLAM Ref2-2Comp 1	10/8/99	3	İ
	CLAMREF2-2 COMP-02	Reference Area 2-2	CLAM Ref2-2 Comp 1	10/8/99	3	
cı :	CUDIM DD COM	D D'.	CUDDAD DD 1 1	10/6/00	(00 )	
Shrimp	SHRIMP BP COMP	Borrow Pit	SHRIMP BP-1-1,	10/6/99	(89 g)	
	İ		SHRIMP BP-1-2,			
	CURN IN DEET COLIN	Reference Area 1	SHRIMP BP-1-3		(7.4.4.)	
	SHRIMP REF1 COMP		SHRIMP PDC-1-2	10/7 and 10/8/99	(74.4  g)	
		(Old Prairie du Pond	]			
	CUDBAD DEED COVE	Creek) Reference Area 2		10,000	(55.)	
	SHRIMP REF2 COMP		SHRIMP Ref2-1	10/8/99	(75 g)	
		(Long Slash Creek)	1			

### 3.28.4.1 Deviation Logs

DIVIDUAL REQUESTING DEVIATION / COMPANY: C. Menzie / Menzie - Come DATE 10/4/99
HEALTH & SAFETY APPROVAL REQUIRED: YES: NO:
PROJECT NAME Solution Avec I PROJECT LOCATION Deud Creek
WEATHER <u>cloudy</u> - sunny PRECIPITATION <u>ione</u> TEMPERATURE 50-70
NUMBER OF HOURS WORKED NUMBER OF EMPLOYEES 7
1. CONTRACT ITEM BEING WORKED ON: 2. ITEM BEING DEVIATED (REF. APPROP. SEC. OF FSP/HASP); 3. REASON FOR DEVIATION: 4. DEVIATION OR FIELD CHANGE TO BE IMPLEMENTED; 5. EQUIPMENT: 6. DEVELOPMENTS WHICH MIGHT LEAD TO ISSUANCES OF A CHANGE ORDER OR BE THE BASIS OF A CLAIM (EQUIPMENT; TIME: MANPOWER; ETC.); 7. REMARKS;
1. Galajia Sampling
2. QA. rinset semples for collections of plents, invovis,
3. plant + inverts are collected by hand + subject wently
fish ove collected by seine and subsequently washed;  the seine is het a sarra of contemination that heals  to be quent hel
4. rinsule blanks will be obtained only for
the Eckman, boul, spoon as a single scuple
5 see 4
6. none
7. decision aus discussed with Steve Brodman
of Weston prier to implementation
RINTED NAME / SIGNATURE OF PREPARER    Gimber   Penny   Link   10/4/19  PRINTED NAME / SIGNATURE OF SOLUTION REP / DATE
DATE PRINTED NAME / SIGNATURE OF USEPA REP / DATE  IF ADDITIONAL SPACE IS REQUIRED,  RECORD ON REVERSE SIDE   Wester 10/4/99 20:45 PM

INDIVIDUAL REQUESTING DEVIATION / COMPANY: C. Menzie / MCA DATE 10/7/99
HEALTH & SAFETY APPROVAL REQUIRED: YES: NO: PROJECT NAME Solution Area I PROJECT LOCATION Dead Creek
WEATHER Suns PRECIPITATION TEMPERATURE 60 - 2
NUMBER OF HOURS WORKED
1. CONTRACT ITEM BEING WORKED ON: 2. ITEM BEING DEVIATED (REF. APPROP. SEC. OF FSP/HASP): 3. REASON FOR DEVIATION: 4. DEVIATION OR FIELD CHANGE TO BE IMPLEMENTED: 5. EQUIPMENT: 6. DEVELOPMENTS WHICH MIGHT LEAD TO ISSUANCES OF A CHANGE ORDER OR BE THE BASIS OF A CLAIM (EQUIPMENT; TIME; MANPOWER; ETC.): 7. REMARKS:
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2 4.8 of Menzin - Cura Gra QAPP
3. no cray his being congut in trys or reiner
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4. Substitute five ten shring for every Bish clepending on what was seen in reference
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6. hom anticinatul
7. Shring is dominant crustagen in Berrow Pit
+ important in diet of Fish: it also would
likely be reflective of tisme concerts tong in
ever fish - publicly a good shrow ate
Chulo, Menzie / Chulo Cimpen Peny Kanty 19/7/99 PRINTED NAME / SIGNATURE OF PREPARER PRINTED NAME / SIGNATURE OF SOLUTIA REP / DATE
DATE PRINTED NAME / SIGNATURE OF USEPA REP / DATE IF ADDITIONAL SPACE IS REQUIRED,

DIVIDUAL REQUESTING DEVIATION COMPANY: Katherine Front DATE 11/3/99	$\underline{\hspace{0.1cm}}$
Menzie-Cons & Associates Inc	
HEALTH & SAFETY APPROVAL REQUIRED: YES: NO:	
PROJECT NAME Dond Creek, Sauget Aven I PROJECT LOCATION Sauget (Calinkia, II)	<u>/</u>
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7. REMARKS:	
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1. Ecological Risk Assessment of Dead Creek	
a. Ecological Risk Assessment WAPP Section 4,8	
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3. Crayfish are vict available in the Ranow Pit.	
H. Smirnip will be substituted for crayfish. They are available.	
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PRINTED NAME / SIGNATURE OF PREPARER () ) PRINTED NAME / SIGNATURE OF SOLUTA REPLICATE	
11/3/99	
PRINTED NAME / SIGNATURE OF USEPA REP / DATE	_
IF ADDITIONAL SPACE IS REQUIRED, RECORD ON REVERSE SIDE	

Menzie-Cura & Associates, Inc. One Courthouse Lane Suite 2 Chelmsford, Massachusetts 01824 Telephone (978) 453-4300 Fax (978) 453-7260

### *MEMORANDUM*

Date: November 3, 1999

File: 648B

To: Kimberly Perry, Solutia
From: Katherine Fogarty (L. Joyanna)
ubject: Minor Changes to Ecological Risk Subject:

Assessment Workplan for Dead Creek

The workplan called for collection of one composite sample of benthic macroinvertebrates for tissue analysis from each creek section, the Borrow Pit, Site M, and the two reference areas. Large freshwater clams were abundant in the Borrow Pit and reference areas and were sampled there. Small snails were abundant in some of the creek sections and in the second creek reference area and were sampled there. Invertebrates large enough to provide mass for tissue analysis were not observed at creek sections E or For Site M.

Given to wester 1/5/99 0-730 101

DEV-017B

	DEVIATION LOG , , ,
INDIVIDUAL REQUESTING DEVIATION	1 COMPANY: C. Menzie / MCA DATE Z/18/00
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PROJECT NAME SAUGET AR	REA I PROJECT LOCATION Dead Creek
WEATHER	PRECIPITATION TEMPERATURE
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PRINTED NAME / SIGNATURE OF PREF  2 / 18 / 00  DATE  IF ADDITIONAL SPACE IS REQUIRE RECORD ON REVERSE SIDE	PRINTED NAME / SIGNATURE OF USEPA REP / DATE

3.28.4.2 Photographs



Photo 3.28.4.3.1. Pyganodon grandis. Specimen in hand is about 5 inches across (October 1999).



Photo 3.28.4.3.2. Palaemonetes kadiakensis Diameter of sieve is 8 inches (October 1999).

### 3.28.4.3 Chain-of-Custody

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Contact Person: Betsy Beaucha	mp			cyande				

shrimp done

PAGE 3 OF 6

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SAMPLE 10 Date Genty Gest Station Locations Containers NOTES  CLAMBP-1 10/190 11:30 V Borrow Pit 3 V Treat as MS/MSD and duple CLAMBP-2 10/190 9:30 V Treat as MS/MSD and duple CLAMBP-3 10/190 9:30 V Paint du Port Creek 1 V CLAMBP-3 10/190 11:00 V By Rollow Pit 1 V CLAMBP-3 10/190 10/190 10:00 V By Rollow Pit 1 V COMPI 1 V CO	SAMPLERS	C.Me	nzie	٤	< Fogarty			1 1										
CLAMBR-2 10/19/10:30 U CLAMBR-1-1 0/19/19 1:30 U Prainedul Part Creek 1 U CLAMBR-2 10/19/19 11:00 U PLABBROW PIT 1 U CLAMBR-3 10/19/19 10:00 U PLABBROW PIT 1 U COMPI	SAMPLE ID		Gemp.	CONT Grati	Station Locations		1	2				NOTES						
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CIAM (1272- 10/8/99) 11:00 / Prainedul Pont Creek 1  CIAM (1272- 10/8/99) 10:00 / Pref BONDIN PIT 1  COMPI	CLAMBP-2	10/2/19	9:30		1		1					/						
CIAM (27-1- 10/8/19) 11:00 / Prainedul Pont Creek 1  CIAM (12-2- 0/9/9) 11:00 / Prainedul Pont Creek 1  CIAM (12-2- 10/4/99 10:00 / Prainedul Pont 1  Compi	CLAM BP-3	496199	16.30	<u> </u>	<i>V</i>		1											
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Serial Number 005783 ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD Phone: (972) 354-7850 Feat: (912) 352-0165 05/06 Fax: 1950) #78-4604 Laboratories Fas: (813) 885-7049 OF PAGE HOJECT HO ROJECT LOCATION MATRO REQUIRED ANALYSES (STATE) TYPE STANDARD REPORT CONTRACT NO. 0 DELIVERY DATE ONE CLIENT PHONE CLIENT FAX EXPEDITED REPORT DELIVERY CLIENT EMAIL 0 (SUNCHASE) NUMBER OF COOLERS SUBMITTED PER SHIPMEIN: SAMPLE REMARKS SAMPLE IDENTIFICATION NUMBER OF CONTAINERS SUBMITTED DATE can use as. H:30 Y 11:30 T: 30 11:00 10:00 2 bottles comp Comp Comol RELINQUISHED BY: (SKIMTURE) RELINDUISHED BY: (SUNATURE) FLINOUISHED BY: (SIGNATURE) TIME TIME 12:4 REDENTED BY: Jupilature) RECEIVED BY: (SIGNATURE) DATE TIME AECEIVED BY: (SIGNATURE) LABORATORY USE ONLY RECEIVED FOR LABORATORY BY: DATE TIME CUSTODY INTACT CUSTODY STL-SL LOG NO. | LABORATORY HEMARKS: SEAL NO. 3916900

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### 3.29 Fish Collection for Tissue Analysis

#### 3.29.1 Rationale/Design

Fish were sampled to determine concentrations of target analytes in the tissues of forage fish and game fish. These data will be used to support both the Ecological Risk Assessment and the Human Health Risk Assessment.

#### 3.29.2 QA/QC Procedures

Field duplicates, MS/MSD samples, and samples split with USEPA representatives are listed on Table 3.29.4. Trip blanks are not necessary for tissue samples. The beach seines and gill nets were not considered a quantifiable source of cross-contamination and rinsing fish in deionized water after sampling further reduced the possibility of cross-contamination. This eliminated the need for an equipment rinsate blank from the beach seines. The deviation log describing this decision is in Section 3.28.4.1.

#### 3.29.3 Field Procedures

Prior to beginning fieldwork, Preparatory Inspection Meetings were held that were attended by a representative of each of the interested parties (Section 3.26.4).

Fish were sampled using a variety of methods. In the creek sectors, beach seining was used exclusively. In the larger water bodies, a combination of minnow traps, catfish traps, gillnets, and beach seining (Photo 3.29.4.3.1) were used. The traps, baited with chicken liver, shiners, and commercial catfish bait, yielded very few fish. The gill nets and beach seines were the most useful for collecting fish. In very shallow water such as Creek Sector C-2, parts of the Borrow Pit, and parts of the reference locations, fish could be sampled by hand collection.

After collection, fish were washed by hand, sorted, and placed in an on-site freezer. At the end of the main sampling event, fish designated for analysis were sent to Savannah River Laboratory on dry ice. Fish designated for taxonomic identification only were sent to Menzie-Cura & Associates, Inc.

At the laboratory fish were kept frozen until filleting and analysis. Table 3.29.4 lists the resulting samples, locations, species, and sample types. White crappie was selected as a recreational species to be filleted. However, insufficient tissue mass was not available for the complete series of analyses, and white bass were filleted to provide tissue for herbicide and/or pesticide analyses (Table 3.29.4). The deviation log documenting this decision is in Section 3.29.4.1.

For forage fish, insufficient tissue was available for all analyses from Creek Sector CS-B and reference area 2). Therefore, it was decided not to analyze these two samples (FFCS-B COMP-01 and FFREF2 COMP-03) for herbicides. The deviation log documenting this decision is in Section 3.29.4.1.

#### 3.29.4 Documentation

The deviation logs for the fish collection are in Section 3.29.4.1, photographs are in Section 3.29.4.2, and the chain-of-custody forms are in Section 3.29.4.3. For fish collection that occurred during the Main Sampling Event, the Daily Work Logs, Work Forecasts, and Safety Meeting are in Section 3.26.4.3 and the field notes are in Section 3.26.4.4.

Table 3.29.4
List of Sample Stations, Dates, and QA/QC Samples for Fish Tissue Analysis
Dead Creek, Borrow Pit and Reference Areas
Sauget Area I

Sample Type	Sample ID	Date	Location	Species	Sample Type	Tissue Type	No. in Composite	Total Wt (g)	Notes*
Crappie fillets	WCBP COMP-01	10/4/99	Borrow Pit	Crappie	Composite	Fillet	12	184.5	
	WCBP COMP-02	11/1/99	Borrow Pit	Crappie	Composite	Fillet	6	77.5	Use WBBP-Fillet-01 for herbicide analysis.
	WCBP COMP-03	11/1/99	Borrow Pit	Crappie	Composite	Fillet	5	64.6	Use WBBP-Fillet-02 for herbicide and pesticide analysis.
	WCREF1 COMP-01	10/4/99	Ref-01	Crappie	Composite	Fillet	8	248	
	WCREF1 COMP-02	11/1/99	Ref-01	Crappie	Composite	Fillet	7	188.2	
	WCREF2 COMP-01	11/2/99	Ref-02-2	Crappie	Composite	Fillet	4	293	
	WCREF2 COMP-02	11/2/99	Ref-02-2	Crappie	Composite	Fillet	5	523.3	Field duplicate/Split with Weston
White bass fillets*	WBBP Fillet-01	10/4/99	Borrow Pit	White Bass	Individual	Fillet	1 1	26.2	To be used for herbicides only.
	WBBP Fillet-02	10/4/99	Borrow Pit	White Bass	Individual	Fillet	1	114	To be used for herbicides and pesticides only.
Largemouth bass	LMBBP COMP-01	10/4/99	Borrow Pit	Largemouth Bass	Composite	Whole Body	3	1467.8	MS/MSD Sample
whole bodies	LMBBP COMP-02	11/3/99	Borrow Pit	Largemouth Bass	Composite	Whole Body	2	769.7	
!	LMBBP COMP-03	11/1/99	Borrow Pit	Largemouth Bass	Composite	Whole Body	3	1004	Split with Weston
	LMBREF1 COMP-01	11/1/99	Ref-01	Largemouth Bass	Composite	Whole Body	3	1321.7	1
	LMBREF1 COMP-02	11/1/99	Ref-01	Largemouth Bass	Composite	Whole Body	3	1027.3	
	LMBREF2 COMP-01	10/8/99	Ref-02-2	Largemouth Bass	Composite	Whole Body	3	922.3	
	LMBREF2 COMP-02	11/2/99	Ref-02-2	Largemouth Bass	Composite	Whole Body	3	1642.2	
Forage fish	FFCS-B COMP-01	10/5/99	CS-B	Lepornis	Composite	Whole Body	91	62.8	
whole bodies			CS-C				l 1		None present
•	FFCS-D COMP-01	10/5/99	CS-D	Lepomis	Composite	Whole Body	225	217.2	Split with Weston
			CS-E				<b>!</b> !		None present
	1	ł	CS-F				1		None present
	FFBP COMP-01	10/4/99	Borrow Pit	Lepomis	Composite	Whole Body	14	115	
	FFBP COMP-02	10/6/99	Borrow Pit	Lepomis	Composite	Whole Body	151	96.1	
	FFBP COMP-03	10/6/99	Borrow Pit	Lepomis	Composite	Whole Body	157	92	
	FFREF1 COMP-01	10/8/99	Ref-01	Lepomis	Composite	Whole Body	3	120.8	
	FFREF2 COMP-01	10/8/99	Ref-02-2	Crappie	Composite	Whole Body	38	126.9	
	FFREF2 COMP-02	10/8/99	Ref-02-2	4 LMBass,1 minnow and 4 Lepomis	Composite	Whole Body	9	69.7	
	FFREF2 COMP-03	10/8/99	Ref-02-1	Minnow	Composite	Whole Body	278	78.6	
Builheads whole	BBBP COMP-01	11/1/99	Borrow Pit	Bullhead	Composite	Whole Body	9	513.7	Field duplicate
bodies	BBBP COMP-02	11/1/99	Borrow Pit	Bullhead	Composite	Whole Body	3	352.2	
	BBBP COMP-03	10/7/99	Borrow Pit	Bullhead	Composite	Whole Body	4	227.4	
	BBREF1-2 COMP-01	10/8/99	Ref-01	Bullhead	Composite	Whole Body	3	148.8	
	BBREF1-2 COMP-02	10/8/99	Ref-01	Bullhead	Composite	Whole Body	4	259.6	
	BBREF2-2 COMP-01	11/2/99	Ref-02-2	Bullhead	Individual	Whole Body	1 1	509.2	MS/MSD sample

## 3.29.4.1 Deviation Logs

**DEV-017** 

		IATION LOG /	, ,
NDIVIDUAL REQUESTIN	IG DEVIATION / COMPANY:	C. Menzie/MCA	DATE 2/18/00
HEALTH & SAFFTY APPI	ROVAL REQUIRED: YES: _	NO: F	h
PROJECT NAME	AUGGI AREA	T PROJECT LOCATION	Dead Creek
WEATHER	PRECIPIT	ATION	TEMPERATURE
NUMBER OF HOURS WO	DRKED	NUMBER OF EMPLOYE	ES
3 REASON FOR DEVI	ED (REF. APPROP. SEC. O	_	
5 EQUIPMENT	D CHANGE TO BE IMPLEM!		R OR BE THE BASIS OF A CLAI
(EQUIPMENT: TIME: 7 REMARKS:	MANPOWER: FTC.):		
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4. White	a Done for	analysis of	herbicides
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5. Nane	special		
6. None	envisioned		<u> </u>
7. None			
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	<u> </u>		J.
		Kemberly Perry/	Kuth fr 3/2916
PRINTED NAME / SIGNA Lorles Menzie		PRINTED NAME / SIGNA	TURE OF SOLODIA REP / DATE
DAT	E 2/18/00	PRINTED NAME / SIGNA	ATURE OF USEPA REP / DATE

**DEV-017A** 

	DEVI	ATION LOG	
INDIVIDUAL REQUESTING	DEVIATION / COMPANY:	C. Menzie /MCA	DATE 2/18/00
HEALTH & SAFETY APPRO	OVAL REQUIRED: YES:	NO: PROJECT LOCATION	Dead Creek
		TION	TEMPERATURE
		NUMBER OF EMPLOYE	
1 CONTRACT ITEM BELL			
2. JTEM BEING DEVIATE	DIREF APPROP. SEC. OF	FSP/HASP);	
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## 3.29.4.3 Photographs



Photo 3.29.4.3.1. Seining at Old Prairie DuPont Creek (November 1999).

### 3.29.4.3 Chain-of-Custody

Project No. Project		C + 1	<del></del>	Project Locati				<del></del>	MENZIE-CURA & ASSOCIATES, INC.					
648B Dea	d Creek	-Sauget Av	eat	Gauget	/Cahok	ia, I	//	···	1 COURTHOUSE LANE, SUITE 2					
DATE: 10/9/9	TE: 10/9/99 WPLERS C. Men rel				Analys	es Require	TEL: 978/453-4300 FAX: 978/453-7260							
SAMPLERS C. P	unril													
SAMPLE ID Date 5	Comp Gre	Station Locations		No. of Containers					NOTES					
Fish Bag 1 16/47				7					told					
FISH COND ID/41		Borrow Pit		7				<del> </del>	Hold					
FISH BOX 4 10 47		Rof Borrow Pit		New 5	<del>  -</del>		<del> </del>	<del> </del>	Hold					
FISH CAUS 10/4+				2										
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Relinquished By: (Signatu	ге)	Date	Time	Received By: (Signature) Date Tim			Date	Time	fred discussions					
Relinquished By: (Signatu	re)	Date	Time	Received By: (Sig	nature)		Date	Time	with a henrie -					
Laboratory:	nah	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		Phone:			J.,		Remarks: Hold Samples until first discussions With C. Menrie - Simples frozen on day of collection					
Contact Person: Betsy	Beauc	barryp												

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PAGE | OF 6

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### 3.30 Vegetation Collection for Tissue Analysis

#### 3.30.1 Rationale/Design

Aquatic plants were collected for analysis of chemicals in tissues. The analysis will be used to estimate exposure to animals, such as muskrat, that feed on plants. To minimize variability associated with differential uptake by plant species, the creeping buttercup (*Ranunculus reptans*) was selected as a representative plant based on its presence in most sample locations (Photo 3.30.4.3.1). *R. reptans* was not found in the Borrow Pit, Creek Sectors E-3 and F-2, Site M, Old Prairie du Pont Creek reference area 1, and reference area 2-2.

#### 3.30.2 QA/QC Procedures

An additional plant sample was taken from reference area 2-1 to provide a field duplicate and MS/MSD sample. Trip blanks are not necessary for tissue samples. Vegetation samples were collected entirely by hand. This reduced the possibility of cross-contamination during sampling and rinsing vegetation samples in deionized water further reduced the possibility of cross-contamination. This eliminated the need for an equipment rinsate blank. The deviation log describing this decision is in Section 3.28.4.1. Plant samples from CS-B-3 were split with USEPA.

#### 3.30.3 Field Procedures

Vegetation sampling consisted of carefully pulling an individual plant, with intact roots, from the substrate by hand, washing off visible soil and sediment (Photo 3.30.4.3.1), and bagging the entire plant. *R. reptans* is a long vine with very short roots. Therefore, the decision was made in the field to not separate stems and roots for analysis. The deviation log can be found in Section 3.30.4.1.

#### 3.30.4 Documentation

Table 3.30.4 shows the locations where plants were sampled for tissue analysis. The deviation log for this task is in Section 3.30.4.1, photographs are in Section 3.30.4.2, and the chain-of-custody forms are in Section 3.30.4.3.

The Daily Work Logs, Work Forecasts, and Safety Meeting Forms for the Main Sampling Event are in Section 3.26.4.3 and the field notes are in Section 3.26.4.4.

Table 3.30.4
List of Sample Stations, Dates, and QA/QC Samples for Vegetation
Sauget Area I

Sample ID	Station	Date of Sample	Species	QA/QC Samples
PTISS B-1	Creek Sector B-1	10/5/99	Ranunculus reptans	
PTISS B-2	Creek Sector B-2	10/5/99	Ranunculus reptans	
PTISS B-3	Creek Sector B-3	10/5/99	Ranunculus reptans	Sample split with USEPA
	Site M		None present	
PTISS C-1	Creek Sector C-1	10/4/99	Ranunculus reptans	
PTISS C-2	Creek Sector C-2	10/4/99	Ranunculus reptans	
PTISS C-3	Creek Sector C-3	10/4/99	Ranunculus reptans	
PTISS D-1	Creek Sector D-1	10/4/99	Ranunculus reptans	
PTISS D-2	Creek Sector D-2	10/4/99	Ranunculus reptans	
PTISS D-3	Creek Sector D-3	10/4/99	Ranunculus reptans	
PTISS E-1	Creek Sector E-1	10/6/99	Ranunculus reptans	Field Duplicate
PTISS E-2	Creek Sector E-2	10/6/99	Ranunculus reptans	-
	Creek Sector E-3		None present	
PTISS F-1	Creek Sector F-1	10/7/99	Ranunculus reptans	
	Creek Sector F-2		None present	}
PTISS F-2	Creek Sector F-3	10/7/99	Ranunculus reptans	
	Borrow Pit 1		None present	
	Borrow Pit 2		None present	
	Borrow Pit 3		None present	
1	Reference Area 1-1		•	
	(Old Prarie DuPont			
	Creek)	10/8/99	Cocklebur - not analyzed	
	Reference Area 1-2		•	
	(Old Prarie DuPont			
PTISS PDC2	Creek)	10/8/99	Ranunculus reptans	
1	Reference Area 2-1		·	
PTISS Ref2-1	(Long Slash Creek)	10/8/99	Ranunculus reptans	Field Duplicate and MS/MSD
	Reference Area 2-2		None present	•

### 3.30.4.1 Deviation Logs

DIVIDUAL REQUESTING DEVIATION / COMPANY: C. Menzie Menzie - Com DATE 10/4/99
HEALTH & SAFETY APPROVAL REQUIRED: YES: NO:
PROJECT NAME Schulia Area I PROJECT LOCATION Deal Creek
WEATHER <u>Cloudy</u> - Sunny PRECIPITATION None TEMPERATURE 50 -70°
NUMBER OF HOURS WORKED 8 NUMBER OF EMPLOYEES 7
1. CONTRACT ITEM BEING WORKED ON: 2. ITEM BEING DEVIATED (REF. APPROP. SEC. OF FSP/HASP): 3. REASON FOR DEVIATION: 4. DEVIATION OR FIELD CHANGE TO BE IMPLEMENTED: 5. EQUIPMENT: 6. DEVELOPMENTS WHICH MIGHT LEAD TO ISSUANCES OF A CHANGE ORDER OR BE THE BASIS OF A CLAIM (EQUIPMENT; TIME; MANPOWER; ETC.): 7. REMARKS:
1. Ecclesial scholing: plant Dille
7. Ecological scapping: plant tissue  2. plant tissue analyses section 7-6 of Ecological
2. plant hissur analyses section 4-6 of Ecological
) 3. The common plant selectare for analysis is a Yine with short roots. I we decided to combine the stem, leaves, wells into a single sample
4. Collect whole plant samples (stems, leaves, we to combined)  rather than separating posts from stems/leaves
5. travel
6. hore
To This modification was discussed with
Steve Brodmen of Western puris to
implementation
PRINTED NAME / SIGNATURE OF PREPARER    Colylog   PRINTED NAME / SIGNATURE OF SOLUTA REP / DATE
DATE  PRINTED NAME / SIGNATURE OF USEPA REP / DATE  IF ADDITIONAL SPACE IS REQUIRED,  RECORD ON REVERSE SIDE  PRINTED NAME / SIGNATURE OF USEPA REP / DATE  OF VENT TO WESTON 10/4/99 20'145 HM

## 3.30.4.3 Photographs



# 3.30.4.3 Chain-of-Custody

# CHAIN OF JUSTODY RECORD

Project No.	Project	Name:	h			Project Location: Sauget/Caho Kia, Ill.					MENZIE-CURA & ASSOCIATES, INC. 1 COURTHOUSE LANE, SUITE 2	
DATE: 10/9/99						Analyses Required					CHELMSFORD, MA 01824 TEL: 978/453-4300 FAX: 978/453-7260	
		N ZU	(Comp Good	Station Locations		No. of Containers	See Notes				NOTES	
PT155 B-1	10/5/99	9:45	V	Dead Creek Section	mB	a	7					
PTISS B-2	Ť	14:10	V	1		a	V					
P7155 B-3	V	9:00	V			3	V		1		SOLT WITH EPA	
TT-55-/	101494	16:15	V	Dead Ineek Sec	tron (	۵	V					
PTISSGA	111	15:30	~	,		a	V		1			
PTISSG3		14:20	V	L V		2	U					
PT155 D-1		10:45	~	Dead (reak-SeitEND)		2	U					
P7155 D2		12,10	V			ಎ	V					
O115543	V	13:55	V	<u> </u>		ے	V					
₽7155 <i>E-</i> )	10/4/99	9:50	V	Dead (near Sec	a	V				desar Treat as field duplica		
PTISSEZ	1/1/11	9:05	V	IX H		a	V					
PTISS F-1				Dead Con K. Section F		a	V					
PT155 F-3		10:45	V,	H	11	ス						
PTLYSING			V,	Prairie du Port	Del Apa ?	1	V,					
7155 Rea-1	19/4/19	16:30		Reforence (nee	h	24	7				MS/MSD 238 told	
Retriquished By: (Signature)  All reuse a Copaty  N/9/99  1440					Received By: (Signature) Date			Date	Time	Remarks: Note 1. Samples frozen		
Relinquished By: (Signature) / Date Time					Received By: (Signature) Date Time				Time	an any or william.		
Relinquished By: (Signature) Date Time					Received By: (Signature) Date Time				Remarks: Note 1. Samples frozen on day of collection. DAnalyses = SVOCS, therbridges, Pestrudio,			
Laboratory:	Sav	ann	ah	Beakhamp		Phone:					POBS, dioxine, Metalo, cg. 3 Homogenize sam pleo	
Contact Per	son: Y	Set se	y v	Beakhamp		·					then split w/ EPA	

PAGE 2 OF 6

### 4. Field Operations Documentation

The field sampling team maintained a set of field notebooks. Forms that were used include chain-of custody, test boring log, rock classification worksheet, initial equipment calibration log, project change order, deviation log, preparatory inspection meeting, clarification log, and ground water sampling log. The appendices contain these forms.

The field notebooks contain tabulated results of field measurements and documentation of field instrument calibration activities. The field notebooks also record the following:

- personnel conducting the site activities, their arrival and departure times, and their destination at the site
- incidents and unusual activities that occur on the site such as, but not limited to, accidents, breaches of security, injuries, equipment failures, and weather-related problems
- changes to the FSP and the HASP
- daily information such as:
  - work accomplished and the current site status
  - equipment calibrations, repairs, and results
  - site work zones.

In the field sampler's individual bound field notebook, samplers noted, with permanent ink, meteorological data, equipment employed for sample collection, calculations, information regarding collection of QA/QC samples, and any observations. Entries were dated, and any entry which was to be deleted had a single cross-out which was signed and dated. The following sampling-related information was recorded in the field notebook by the field sampling team:

- project name and number
- sample number
- sampling location
- required analysis
- date and time of sample collection
- type and matrix of sample
- sampling technique
- preservative used, if applicable
- sampling conditions

- observations
- initials of the sampler.

Field data documentation procedures were minimal in scope. Only direct reading instrumentation was employed in the field. The use of pH, conductivity, and turbidity meters; a PID; a real-time aerosol monitor (RAM); and thermometers generated some measurements directly read from the meters following calibration by the respective manufacturer's recommendations. Such data was written into field notebooks or on the appropriate activity log immediately after measurements were taken. If errors were made, results were legibly crossed out, initialed, and dated by the field member and corrected in a space adjacent to the original entry. Later, when the results forms were filled out, the O'Brien & Gere field leader proofed the forms to assess whether transcription errors had been made.

Photographic records were developed through the use of digital photographs showing slug test borings, bedrock corings, waste sampling, and test trenches.

### 4.1. Sample Documentation

### 4.1.1. Sample Identification System

Examples of the sample identification system are shown below:

- Soil gas survey data: SG-G-1 where "SG" denotes soil gas survey, "G" (H, I, L, N) is the site designation, and "1" denotes a sequential sample number for the grid cell samples and SGHNE-100, where "SG" denotes soil gas survey, "H" is the site designation, "NE" is the transect direction, and "100" is the foot spacing for the additional transect locations.
- Waste samples: WASTE-G-B1-12-14FT, where "WASTE" denotes a waste sample, "G" is the site designation, "B1" denotes the boring number, and "12-14FT" denotes sample depth. For composite samples, the sample depths were replaced with COMP.
- Fill area ground water samples: EE-02, where EE-02 denotes an existing well name or former location. A "GP" extension denotes a Geoprobe™ sampling tool was used to collect the sample.
- Upgradient ground water samples: UGGW-EE-20-100FT, where "UGGW" denotes an upgradient ground water sample, "EE-20" denotes a monitoring well ID, and "100FT" denotes sample depth. FT may be feet and a final extension of "sub" or

- "replace" where "sub" denotes a substitute sample location and "replace" denotes a replacement sample. "EB, MS, MSD, FD, and DUP" are possible extensions (see explanation below).
- Alluvial aquifer samples: AA-I-S1-(24-28)FT or AA-H-S1-(24-28)FT where "AA" denotes an alluvial aquifer sample, "I" or "H" is the site designation, "S1" is the numbered sampling station, and (24-28)FT is the sample depth. Feet may also be "ft" and may not have "()". "EB, MS, MSD, FD, and DUP" are possible extensions (see explanation below). Site I numbered sampling station is S4.
- Downgradient alluvial aquifer samples: AA-I-S1-24-28ft, AA-GHL-S1-24-28ft, or AA-SW-S1-24-28ft where "AA" denotes an alluvial aquifer sample; I, GHL, or SW denotes Site I, west of GHL, and southwest of GHL, respectively; "S1" is the sequentially numbered sampling station; and "24-28ft" is the sample depth, may also be "24-28FT" or "(24-28)FT". EB, FD, MS, MSD, and DUP are possible extensions (see explanation below). Site I numbered sampling stations did not exceed S3.
- Bedrock ground water samples: Deviation submitted for using BR-G where "BR" denotes a bedrock ground water sample and "G" denotes site designation (Section 3.10.4.1). "EB, MS, MSD, and FD" are possible extensions (see explanation below).
- Shallow residential ground water samples: SGW-S1-15FT where "SGW" denotes a shallow ground water sample, "S1" is the sequentially numbered sampling location, and "15FT" indicates sample depth. "MS, MSD, and DUP" are possible extensions (see explanation below).
- Time series ground water samples: TS-S1-12HR where "TS" denotes a time series sample, "S1" is the sequentially numbered sampling location, and "12HR" indicates sample time. "MS, MSD, and FD" are possible extensions (see explanation below).
- Domestic well samples: DW-ABCD-1 where "DW" denotes a
  domestic well sample, "ABCD" denotes the first four letters of
  the well owner's last name, and "1" denotes a sequential sample
  number. "MS, MSD, and DUP" are possible extensions (see
  explanation below).
- Undeveloped area soil samples: UAS-T1-S1-0.5FT where "UAS" denotes an undeveloped area soil sample, "T1" is the transect number, "S1" is the sequentially numbered sampling location, and "0.5FT" or "0.5ft" indicates sample depth. "EB, FD, and MS/MSD" are possible extensions (see explanation below).

- Developed area soil samples: DAS-T1-S1-0-0.5FT where "DAS" denotes a developed area soil sample, "T1" is the transect number, "S1" is the sequentially numbered sampling location, and "0-0.5FT" indicates sample depth. "EB, FD, and MS/MSD" are possible extensions (see explanation below).
  - Background soil samples: BS-EE20-3-6FT where "BS" denotes a background soil sample, "EE20" is the well location adjacent to the soil sample, and "3-6FT" indicates sample depth. "EB, MS/MSD, FD, and SUB" are possible extensions (see explanation below).
  - Old Prairie duPont Creek sediment samples: BSSED-PDC-DS-S-0-54" where "BSSED" denotes a broad-scan sediment sample, "PDC" denotes Old Prairie duPont Creek, "DS" denotes downstream, "S" denotes south sampling location, and "0-54" indicates sample depth. May also use "US" to denote upstream and "IN" to denote inches. "EB, FD, and MS/MSD" are possible extensions (see explanation below).
- Developed/undeveloped area sediment samples: FASED-CSA-S1W-0-11" where "FASED" denotes a focused analysis sediment sample, "CSA" designates a Dead Creek sector, "S1W" is the sequentially numbered sampling location and compass direction for the side of the creek, and "0-11" denotes sample depth. Inches may be denoted as "IN". Other compass directions are E, W, and S. "BPL" denotes Borrow Pit Lake. "FASED" was left off Ids for CSC-S1-S5 and S12. "EB, FD, and MS/MSD are possible extensions (see explanation below).
- Borrow Pit Lake ecological sediment samples: "BPLESED-S1-0.2FT where "BPLESED" denotes an ecological sediment sample from Borrow Pit Lake, "S1" is the sequentially numbered sampling location, and "0.2FT" denotes sample depth. May not have a depth designator. "FD and MS/MSD" are possible extensions (see explanation below).
- Dead Creek/ecological sediment samples: SED-CSA-S1 where "SED" denotes a sediment sample, "CSA" designates the Dead Creek sector, and "S1" is the sequentially numbered sampling location. May have "0.2FT", which indicates sample depth. RA-1,RA-2 denotes Reference Areas 1 and 2, respectively. "EB, FD, and MS/MSD" are possible extensions (see explanation below).
  - Surface water samples: SW-CSA-S1, SW-BPL-S, or SW-RA1-S1 where "SW" denotes a surface water sample; "CSA", "BPL" or "RA1" designate Dead Creek sector, Borrow Pit Lake, or Reference Area number, respectively; "M" denotes Site M; PDC denotes Prairie duPont Creek; and "S1" is the

sequentially numbered sampling location. "US" and "DS" denote upstream and downstream, respectively. "EB, MS, MSD, and FD" are possible extensions (see explanation below).

- Air samples: AIR-V-1, AIR-S-1, AIR-M-1, AIR-P-1, or AIR-D-1 where "AIR" denotes an air sample; "V", "S", "M", "P", or "D" designate a VOC, SVOC, metals, PCB, or dioxin sample, respectively; and "1" denotes a sequential sample number. An "FB" extension denotes a field blank.
- Grain-size analysis: SITE G 14'to18', Site "L" 12-16feet, ST-N-D-18-22' where SITE G, Site "L", and ST-N denote site Ids; "D" denotes the deep boring; and 14'-18', 12-16feet, and 18-22' denote sample depth.
- Waste profiling: WI-COMP, where "WI" denotes a waste sample collected from Site I and "COMP" denotes a composite sample.
- Pilot test treatability samples: Leach2-Site I, where "Leach2" denotes leachate sample 2 for testing, "Site I" denotes site from which sample was collected.

Extensions: "MS" denotes a matrix spike, "MSD" denotes a matrix spike duplicate, "MS/MSD" denotes a matrix spike/matrix spike duplicate for soil or sediment samples, "FD" denotes a field duplicate sample, "DUP" denotes a duplicate sample, "FB" denotes a field blank, and "EB" denotes an equipment blank.

#### 4.1.2. Sample Labels

For proper identification in the field and proper tracking by the analytical laboratory, samples were labeled in a clear and consistent fashion. Sample labels were waterproof or sample containers were sealed in plastic bags. Field personnel maintained a sampling log sheet containing information sufficient to allow reconstruction of the sample collection and handling procedures at a later time.

A completed sample label was attached to each investigative or QC sample. The following was recorded with permanent ink on labels by the field sampling team:

- project name and number
- sample number identification
- initials of sampler
- sampling location (if not already encoded in the sample number)
- required analysis
- date and time of sample collection
- space for laboratory sample number (only on the sample tag)
- preservative used, if applicable.

### 4.1.3. Chain-of-Custody Records

Chain-of-custody procedures were instituted and followed throughout the sampling activities. Samples are physical evidence and were handled according to strict chain-of-custody protocols. The field sampler was personally responsible for the care and custody of the sample until transferred. For proper identification in the field and proper tracking by the analytical laboratory, samples were labeled in a clear and consistent fashion.

The following information was recorded on the chain-of-custody by the field sampling team:

- project name and number
- sample description/location
- required analysis
- date and time of sample collection
- type and matrix of sample
- number of sample containers
- analysis requested/comments
- sampler signature/date/time
- airbill number.

The laboratory assigned a number for each sample upon receipt. That sample number was placed on the sample label. The label will be attached to the sample container.

A chain-of-custody document providing all information, signatures, dates, and other information, as required on the example chain-of-custody form in the 1999 FSP Appendix A, was completed by the field sampler and provided for each sample cooler. When transferring the possession of samples, the individuals relinquishing and receiving signed, dated, and noted the time on the chain of custody. The field sampler signed the chain-of-custody form when relinquishing custody, made a copy to keep with the field file, a copy for Solutia, a copy for O'Brien & Gere Laboratories, and included the original form in an airtight plastic bag in the sample cooler with the associated samples.

#### 4.2. Field Analytical Records

Field analytical records for the Support Sampling Project consisted of gas chromatograms from the field GC used in the soil gas survey and field notebook entries for field instruments. Chromatograms are included in Section 3.2.4.3. In addition to information printed on the chromatograms, field notes were added as appropriate. Information detailed on each chromatogram included:

- sample number identification
- initials of sampler
- sampling location (if not already encoded in the sample number)
- required analysis
- date and time of sample collection
- date and time of analysis
- instrument name
- column and detector type
- carrier gas and flow rate
- backflush time
- injection volume
- gain setting

Only direct reading instrumentation was employed in the field. The use of pH, conductivity, and turbidity meters, a PID, a RAM, and thermometers generated some measurements directly read from the meters following calibration according to the respective manufacturer's recommendations. Such data was written into field notebooks or field sampling logs immediately after measurements were taken. Calibration records were recorded on the Initial Equipment Calibration Log and, if recalibration was required during the day, in the field notebooks.

### 4.3. Data Management and Retention

The field data and documentation as described in this section is part of the final evidence file. The final evidence file is the central repository for all documents which constitute evidence relevant to sampling and analysis activities as described in the FSP and the QAPP.

The final file consists of the following:

- laboratory data packages, including summary and raw data from the analysis of environmental and QC samples, chromatograms, mass spectra, calibration data, worksheets, and sample preparation notebooks
- chain-of-custody records
- data validation reports.

The following documentation supplements the chain-of-custody records:

- field notebooks and data
- field collection report
- photographs and drawings
- progress and QA reports
- contractor and subcontractor reports
- correspondence.

The evidence file must be maintained in a secured, limited-access area until all submittals for the project have been reviewed and approved and for a minimum of six years past the submittal date of the final report.

# 5. Personal Protective Equipment

Personal protective equipment (PPE) requirements for each level of protection for O'Brien & Gere personnel are described in the HASP prepared for these field activities.

## 5.1. Protective Equipment Selection

Initial levels of PPE were as shown in the following table.

Activity	Level B	Level C	Modified Level D	Level D
Trenching		Observation		
Soil gas sampling		Initial		
Magnetometer survey			Initial	
Installation of soil borings and collection of cuttings		Initial		
Ground water sampling at existing wells		Initial		
Installation and sampling of ground water wells		Initial		
Domestic water sampling				Initial
Surface and subsurface soil sampling		Area G	Initial	
Surface water and sediment sampling			Initial	
Air sampling				Initial

## 6. Sample Packaging and Shipping

A completed sample label was attached to each investigative or QC sample and the sample placed in a shipping container. Information to be recorded on sample labels is described in Section 4.1.2. Information to be recorded on chain-of-custody forms is described in Section 4.1.3. The sample identification system used in the field is described in Section 4.1.1.

Sampling containers were packed in bubble wrap sheets or bubble wrap bags and put in plastic bags to help prevent breakage and crosscontamination. Samples were shipped in coolers, each containing a chain-of-custody form, ice, and ice packs to maintain inside temperature at approximately 4°C. Sample coolers were sealed between the lid and sides of the cooler with a custody seal prior to shipment. The custody seal was an adhesive-backed tape that easily rips if it is disturbed. Samples were shipped to the laboratory by common overnight carrier. The field sampling team sent sample coolers to Savannah Labs. For samples collected for dioxin and dibenzofuran analysis, samples were sent to Triangle Labs. Samples were not sent to another laboratory without the permission of USEPA Region V. Sample transportation complied with U.S. Department of Transportation and ICAO/IATA (1999) regulations. Special sampling packing provisions were made for samples requiring additional protection and for samples to Thompson Engineering for soil physical analysis.

Samples remained in the custody of the sampler until transfer of custody was completed. Transfer consisted of:

- delivery of samples to the laboratory sample custodian
- signature of the laboratory sample custodian on the chain-ofcustody document as receiving the samples and signature of sampler as relinquishing the samples.

When a carrier was used to take samples between the sampler and the laboratory, a copy of the airbill was attached to the chain-of-custody to maintain proof of custody.

# Section 7

### 7. Investigation-Derived Wastes

Sampling activities occurred in widely separated locations. Therefore, personnel and equipment decontamination was accomplished at each sampling area using temporary facilities. Chapter 8 of the HASP described personnel and monitoring equipment decontamination procedures and supplies. PPE, disposal sampling equipment, cuttings, purge waters, and field decontamination wastes were collected at the point of generation and stored in temporary containers. PPE, solids, and liquids were consolidated in separate bulk containers at a central area. The sampling procedures were developed to minimize the quantity of waste generated. Additional activity-specific information on disposal of IDW was contained in Chapter 3 of this FSR. Waste tracking logs are included in Appendix E.

### 8. Field Assessment/Inspection

The performance audit was an independent check to evaluate the quality of data being generated. The system audit was an on-site review and evaluation of the QC practices, sampling procedures, and documentation procedures.

At the discretion of the O'Brien & Gere project manager, performance and system audits of field activities were conducted to verify that sampling and analyses were performed in accordance with the procedures established in the FSP and the QAPP. The audits of field activities included two independent parts: internal and external audits.

The internal audits were performed by the O'Brien & Gere Quality Assurance Officer (QAO). The external audits were performed by USEPA Region V.

### 8.1. Field Performance and System Audits

#### 8.1.1. Internal Field Audits

Internal Field Audit Responsibilities – Internal audits of field activities including sampling and field measurements were conducted by the O'Brien & Gere QAO.

Internal Field Audit Frequency – These audits verified that all established procedures were followed. Internal field audits were conducted at least once at the beginning of the site sample collection activities and annually thereafter.

Internal Field Audit Procedures – The audits included examination of field sampling records, field instrumentation operating records, sample collection, handling and packaging in compliance with the established procedures, maintenance of QA procedures, chain of custody, and other elements of the field program. Follow-up audits were conducted as necessary to correct deficiencies and to verify that QA procedures are maintained throughout the project. The audits involved review of field measurement records, instrumentation calibration records, and sample documentation. The areas of concern in a field audit included:

- sampling procedures
- decontamination of sampling equipment, if applicable
- chain-of-custody procedures

- standard operating procedures
- proper documentation in field notebooks
- subcontractor procedures.

#### **8.1.2.** External Field Audits

External Field Audit Responsibilities – External field audits were conducted by USEPA Region V.

External Field Audit Frequency – External field audits were conducted at any time during the field operations. These audits may or may not have been announced and were at the discretion of USEPA Region V.

Overview of the External Field Audit Process – External field audits were conducted according to the field activity information presented in the FSP and the QAPP.

### 9. Corrective Action

Corrective action is the process of identifying, recommending, approving, and implementing measures to counter unacceptable procedures or out-of-control performance which can affect data quality. Corrective action can occur during field activities, laboratory analyses, data validation, and data assessment. Corrective action was only implemented after approval by the O'Brien & Gere project manager or the O'Brien & Gere field leader. If immediate corrective action was required, approvals secured by telephone from the project manager were documented in an additional memorandum.

For noncompliance problems, a formal corrective action program was developed and implemented at the time the problem was identified. The person who identified the problem was responsible for notifying the O'Brien & Gere project manager, who in turn notified the USEPA Region V. Implementation of corrective action was confirmed in writing through the same channel.

#### 9.1. Field Corrective Action

Corrective action in the field can be needed when the sample network is changed (i.e., more or less samples, sampling location changes, and related modifications) or sampling procedures and/or field analytical procedures require modification due to unexpected conditions. Technical staff and project personnel were responsible for reporting all suspected technical or QA nonconformances or suspected deficiencies of any activity or issued document by reporting the situation to the O'Brien & Gere field leader. The O'Brien & Gere field leader was responsible for assessing the suspected problems in consultation with the O'Brien & Gere project manager on making a decision based on the potential for the situation to impact the quality of the data. If it was decided the situation requires corrective action, the O'Brien & Gere project manager notified the Solutia remedial project manager.

If appropriate, the O'Brien & Gere field leader verified no additional work dependent on the activity of concern was performed until the corrective actions were completed. Corrective action for field measurements included:

Repeat the measurement to check the error.

- Check for proper adjustments for ambient conditions such as temperature.
- Check the batteries.
- Recalibrate.
- Check the calibration.
- Replace the instrument or measurement devices.
- Stop work (if necessary).

The O'Brien & Gere field leader was responsible for site activities. In this role, the O'Brien & Gere field leader at times was required to adjust the site programs to accommodate site-specific needs. When it became necessary to modify a program, the responsible person notified the O'Brien & Gere field leader of the anticipated change and implemented the necessary changes after obtaining the approval of the O'Brien & Gere field leader. The change in the program was documented on either a deviation log, clarification log, preparatory inspection meeting form, daily work log, and/or change orders, as appropriate, and signed by the O'Brien & Gere field leader (or designee) and Solutia remedial project manager (or designee). The O'Brien & Gere field leader (or designee) and Solutia remedial project manager (or designee) approved the change in writing or verbally prior to field implementation, if feasible.

The O'Brien & Gere field leader was responsible for controlling, tracking, and implementing identified changes. Reports on changes were distributed to affected parties, which includes USEPA Region V.

Corrective actions were implemented and documented in the field notebook. No staff member initiated corrective action without prior communication of findings through the proper channels.

The O'Brien & Gere QAO and laboratory QAO may identify the need for corrective action during either the data validation or data assessment. Potential types of corrective action may include resampling by the field team or reinjection or reanalysis of samples by the laboratory. These actions are dependent upon the ability to mobilize the field team or whether the data to be collected is necessary to meet the required QA objectives. When the O'Brien & Gere QAO or laboratory QAO identifies a corrective action situation, it is the O'Brien & Gere project manager who will be responsible for approving the implementation of corrective action, including resampling, during data assessment. Corrective actions of this type will be documented by the O'Brien & Gere QAO and the laboratory QAO.